Telephony.

THE AMERICAN TELEPHONE JOURNAL

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CHICAGO, MARCH 27, 1915

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like the trees are anchored below the ground. They are flexible and give to extreme forces from below the ground upwards, the ground resistance acting as a cushion, while the wood pole is dead and non-responsive.

Write today for description of the Carbo Poles for Telephone, Power and Lighting work.

CARBO Steel Post Co. Chicago

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The Automatic Monitor

"Devised to Supervise"

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Does Much

Costs Little NOW

It tells you all about your operators except what they think. *"Ask your neighbor"*

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It might be to your advantage to get particulars concerning Hall's Non-Arcing Mica Fuses.

Frank B. Hall Co.
Newton Falls, Ohio

Pat. U. S., Nov. 1904, and Foreign Countries

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There is no "guess-work" with Frankel Testing Clips; *they detect trouble instantly*

Just clamp a Frankel Testing Clip on the wire—the point pierces the insulation—the connection is made—and trouble is located instantly and accurately. No wire-skinning, tapping—or damaged insulation.

A necessity for every troubleman's kit.

Less Than Dozen	Dozen Lots	Hundred Lots	500 Lots	1000 Lots
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Frankel Display Fixture Co.

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ALL SIZES AND CAPACITIES

Hard Drawn Copper Telephone Wire.

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A Non-corroding Soldering Flux, thoroughly compounded of absolutely pure materials. Made in the salt and paste forms and sold in every part of the U. S. with guarantee to give the most satisfying results. Generous sample FREE

The M. W. Dunton Company
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This

TELEPHONE

For

Your Farm Lines

The Transmitter consumes less battery for an equal intensity and volume of transmission.

The Generator has a greater current output for its weight than any other.

The Ringer has the least tendency to stick or freeze, yet is extremely sensitive.

The Receiver is strongly constructed and is not excelled by any for its receiving qualities.

The Induction Coil, Hook switch and other associated parts give the best of service.

All apparatus is mounted in an accessible manner.

This Telephone has been on the market for seven years without a change and stands today unequaled.

Write for prices.

Cracraft, Leich Electric Co.

Main Office and Factory
Genoa, Ill.

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Kansas City, Mo.

Swedish-American Desk Telephone

NEAT and ARTISTIC

Easiest to Inspect

The hook can be removed as a unit by releasing 2 screws. Cat. No. 31 tells more about it.

Swedish-American Telephone Mfg. Company

5237 Ravenswood Ave.
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Yager's Soldering Salts

Have you tried the old Yager's Soldering Salts in its NEW DRESS? For more than a year we have been testing our new enameled screw top can as a container for Yager's Soldering Salts;—NOT because we doubted that we could use a can, for we KNEW we could, but to find out whether the salts would retain their dry granular form better. We are satisfied that they will, and we want our friends to be satisfied also. In the new form you get a smaller, neater package which makes a good display, and you avoid all vexatious breakage. If you have not yet tried Yager's in cans, send us that order.

Alex. R. Benson Company

Hudson, New York

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Foil, Sheets, Wire, Rivets and Contacts

All Forms Made According to Specifications. Platinum Scraps Purchased

Send for literature

Baker & Company, Inc.

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Copper Clad Drop Wire

No. 17. 7/64" Rubber Insulation Weather-proof Braid and Paired—Raised Thread Tracer

Copper Clad Drop Wire has a high elastic limit and affords maximum tensile strength. It is economical and thoroughly dependable.

We always have it in stock
Write for our prices

Belden Manufacturing Company
2302 South Western Avenue, CHICAGO

Whatever kind of a cord you need—Runzel-Lenz has it

We are professedly cord manufacturers. That's how we have built up our business. Yet we built it upon "quality." A telephone man who uses Runzel Lenz Cords immediately distinguishes himself for good foresight and judgment. In the end it pays his company and his company pays him. Remember that whether it's a Switchboard, Receiver, Operator, Desk Set, Transmitter or Moisture Proof Cord—"Runzel Lenz" makes it.

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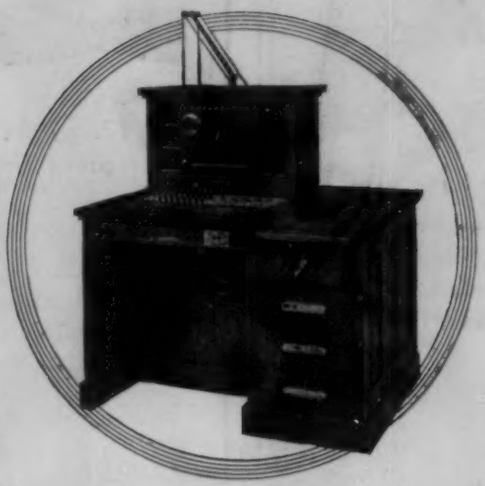
Runzel-Lenz Electric Mfg. Co.
1751-1753 N. Western Ave. Chicago, Ill.

There's a Big Field for the Sale of P. B. X. Systems



No. A-5620

Do you realize the possibilities for the sale of Private Branch Exchange switchboards in your city? Now that the general prediction of the business world is that we are on the eve of the greatest era of prosperity this country has ever seen, why not investigate the requirements of business concerns for telephone systems?

They are buying more typewriters, enlarging their present quarters, in some cases building new establishments; in fact, stocking up on every office appliance that will make for better efficiency when the business rush arrives.

You have a proposition that is as necessary to a business concern as a hearty meal is to a starving man, and it's simply up to you to explain the many time-saving features a P. B. X. system affords. Furthermore, to help you, we will furnish you with free advertising assistance that will bring results.

As for the equipment to install no better selection can be made than any of the various types of Stromberg-Carlson P. B. X. systems. Long satisfying service, beauty in design and the guarantee that every detail of the apparatus is correctly constructed of the best materials obtainable is what you get when you decide to use Stromberg-Carlson equipment.

The above illustration shows one of the many types we have to offer. It is our No. A-5620 cabinet, which has a capacity of either 60 or 120-lamp signal line equipments, for either 20 or 40-volt systems. All the apparatus and terminals are within easy reach.

Nothing would please us more than to go over this proposition with you in detail, and doing this will not obligate you in any way. We simply want to explain what we can do for you. It's an opportunity you cannot afford to pass up. Act today.

STROMBERG-CARLSON TEL.MFG.CO

ROCHESTER, NEW YORK, U.S.A.

CHICAGO, ILL. TORONTO, CANADA.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Code No. 1000

The Code No. 1000 Two-Piece Desk Set is the Popular Magneto Instrument Because of Its Reliability and Pleasing Design

THE subscriber appreciates the many desirable features found in the No. 1000 two-piece magneto desk telephone set. The desk stand is strongly constructed, but is not heavy. It is built to give service without the constant aid of the repairman. You can save money by adopting the No. 1000 type as your standard desk set.

If you are not familiar with this set, let us send you a sample. Compare it with other makes, and if it does not prove superior in every way, return it at our expense.

If you would like more information we will gladly mail you Bulletin No. 1002 in which this desk set and other magneto telephones are described in detail. Write for this bulletin today—you should have it on your desk.

STROMBERG-CARLSON TEL.MFG.CO.

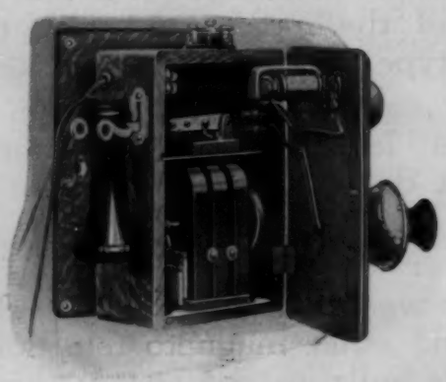
ROCHESTER, NEW YORK, U.S.A.

CHICAGO, ILL. TORONTO, CANADA.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

The New MONARCH No. 430

Wall Space, 11½" x 7⅜"



MONARCH for SERVICE

This Telephone was designed for the subscriber who objects to the large cabinet of the compact type telephone. It is equipped with standard Monarch apparatus throughout, and while the cabinet is small, the parts are so arranged that anyone of them can be inspected or repaired without trouble—the usual Monarch accessibility being noticeable.

The cabinet is hinged in two places, at the door and at the backboard. With this arrangement you can open it so every connection, every wire and every piece of equipment is in plain sight and within easy reach.

No space for batteries is provided, but all other parts are included in the cabinet and binding posts for connection with battery wires are conveniently placed.

The Code No. 430 covers an instrument with 3-bar generator and 80 ohm ringer for individual town line use, but both series and bridging telephones can be supplied in this type. The 4-bar bridging uses the same size cabinet, but the 5-bar requires a cabinet a little larger and of a slightly different design.

The new Telephone Bulletin No. 27 illustrates and describes this telephone. Prices right. Quick shipments.

MONARCH for SERVICE

Monarch Telephone Mfg. Co.

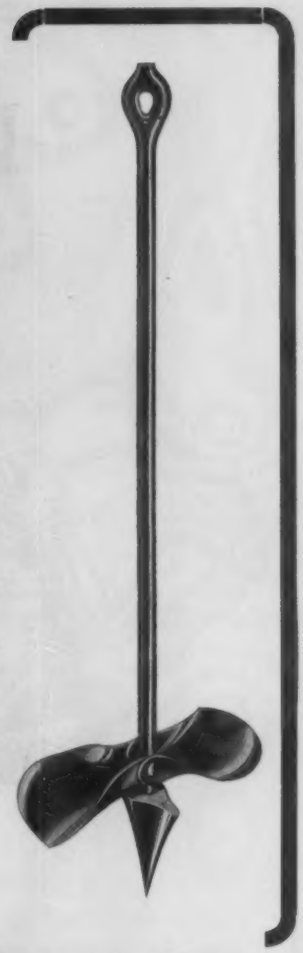
FORT DODGE, IOWA

Old man "Wayback," he dug and he dug and he dug.

He tamped and he tamped and he tamped.

He filled and he filled and he filled.

And at the close of day he was on his way.



DRIVE & TWIST ANCHORS

Thirty years ago all anchoring was done by means of buried slugs—labor was cheap and cost was not much of an object—there was no competition. The average cost per anchor installed was about $5.00.

Twenty years ago this cost was slightly reduced by using various types of patent anchors some of which were dropped into holes and were expanded and then the holes filled and tamped. Others were the "post hole auger types" of anchors—just like post hole augers they churned their way down only they were not lifted out—they were left there and the guy wire attached. The expansion anchors required digging, filling and tamping. They were covered with disturbed soil. The auger types of anchors churned the soil to pieces—both most undesirable results.

NOW it's the DRIVE & TWIST ANCHOR

No digging, no screwing, no tamping. Just driven down with a sledge and then twisted three revolutions to the right. Only a few minutes of one man's time and the job is complete. Total cost is much less than that of any other anchor on the market. The soil retains its original solidity—it gives the greatest possible resistance towards pulling up. That's why Drive & Twist Anchors hold the biggest load and never creep.

DRIVE & TWIST ANCHORS
HOLD MORE
COST LESS

On April 1st the "New Model Drive & Twist Anchor will be ready for you." It is the finest anchor that has ever been built. Note the illustration in the upper right hand corner. It is built of steel throughout—no castings—no welds—no threads to slip or strip. The rod, point and eye are drop forged of one solid piece. It is extra heavy throughout—on the smallest Drive and Twist Anchor the rod is ¾ inch in diameter. The eye is elliptical—it cannot be damaged by sledging. The sharp spear point acts as a pilot when going through gravel, roots, hard clay, etc. The anchor is made of the best material, with highest grade of workmanship. It costs more to produce than any other, still your cost is even lower than on cheap old fashioned anchors.

Have you tried the new model Drive & Twist Anchor? If not, let us send you a dozen subject to trial and approval. We guarantee them to hold much more and cost much less than any other form of anchorage on the market. If you find them otherwise just send them back and we will refund you the full purchase price. Fill in the attached coupon and send it back today.

But "Bill Driveantwis" just used his head. He drove his anchor

And twisted it

He got power and economy. His anchor was D. & T.

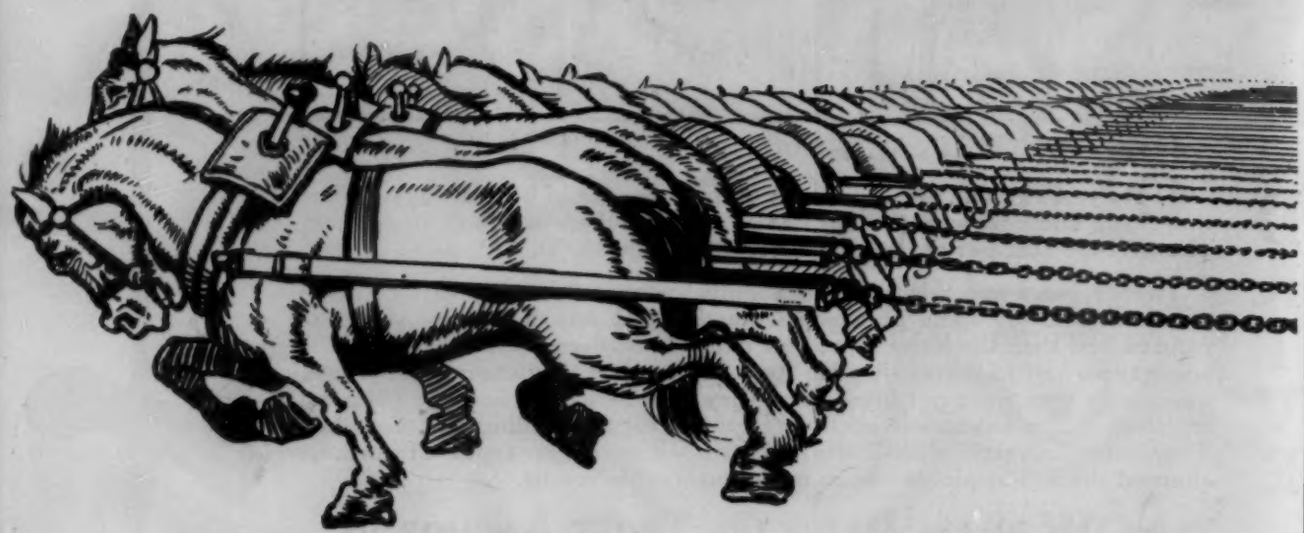
NET PRICES F. O. B. LA CROSSE, WIS.

	Rod	Span of Blades	In Lots of 12 to 50
No. 1.	5 ft. long, ¾ in. dia.	8 in.	.74 each
No. 2.	5 ft. long, ⅞ in. dia.	10 in.	1.25 each
No. 3.	6 ft. long, ⅞ in. dia.	12 in.	1.50 each

GUND MFG. CO.
GESELL BLDG. LA CROSSE, WIS.

Date.....
Name of your Company.....
Town .....
What kind of anchorage do you use?.....
How many do you use per year?.....
Have you ever used the Drive & Twist anchor?.....
Shall we send you trial order of 12?.....
What size?.....
Signed by.....

Pulling Together—
Team Work



Is one reason for the growing demand for Garford Manufacturing Company apparatus. The customer's interest is our interest; we work and pull with you for the result we are all after—SUCCESS.

When you place your business with us, our work is just started—we're interested in your success—your satisfaction—and nothing short of that satisfies us. Isn't it worth while to deal with a concern that is pulling for you from start to finish?

Your business interests us and we are ready to prove to you our interest by quoting you the right prices—supplying the best equipment and give you service that is service. Make up your mind now to get a proposition from us on your next order for Telephones or that new Switchboard.

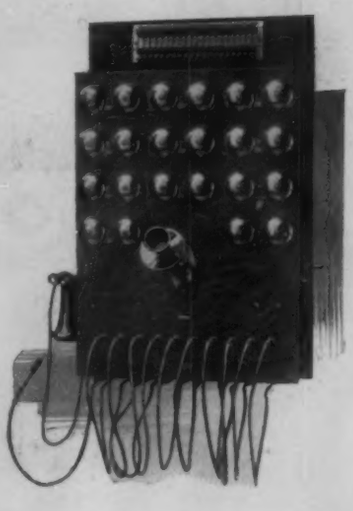
The Garford Mfg. Co., Elyria, Ohio

BRANCH
GARFORD MFG. CO.
Kansas City, Mo.

DISTRIBUTORS
DEAN ELECTRIC CO., Seattle, Wash.
DEAN ELECTRIC CO., Los Angeles, Cal.
SUMTER TEL. & SUPPLY CO., Sumter, S. C.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

No. 41
Ringer Type Magneto Wall Switchboard



The switchboard illustrated has been particularly designed for private systems, or small village exchanges—and is especially recommended for country party line service. The board is **complete** in itself and equipped with **operator's telephone, hand generator, connecting cords,** and **all necessary apparatus** for the operation of the board.

These boards are provided either with or without Lightning arresters as desired.

The **cabinet** is constructed in a most substantial manner from the **best grade thoroughly seasoned quarter-sawed oak.** The back board is designed to fasten to the wall and the front portion or switchboard proper is hinged to the back board, permitting of its being swung out—exposing the wiring and apparatus.

We pay the same attention to detail in the building of these ringer type switchboards, as to the largest board we manufacture.

We make all kinds and sizes of manual switchboards, and for all purposes.

Apparatus

The **apparatus** used in the building of this board is **standard "Garford" quality,** giving the assurance of satisfactory results, from both service and up-keep standpoints. Garford apparatus has always set the pace for standard of excellence, and has withstood the tests of time and exacting conditions.

Get Our Figure on Your Next Board

The Garford Mfg. Co., Elyria, Ohio

BRANCH
GARFORD MFG. CO.,
Kansas City, Mo.

DISTRIBUTORS
DEAN ELECTRIC CO,, Seattle, Wash.
DEAN ELECTRIC CO., Los Angeles, Cal.
SUMTER TEL. & SUPPLY CO., Sumter, S. C.

The Kellogg Extra-Compact Telephone

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

This telephone, with a sixteen-year record unequaled in the history of telephony, is a money maker of the greatest reliability. Send today for our wonderfully illustrated new descriptive folder and bulletins on this unequaled magneto set—"Use is the Test."

Kellogg Switchboard and Supply Company

Main Office and Factory, Chicago, Illinois

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

The money you invest in

The Automatic System

EARNS YOU PROFITS

IT pays interest to the investors who have advanced capital to install the equipment. It meets the cost of maintenance and operation, and provides a reserve for depreciation.

But besides this, the economy of the Automatic enables your Company to build up a surplus which may be used to finance the growth which the popularity of Automatic service insures, or may be distributed to stockholders as extra dividends, thus adding greatly ly to the value and marketability of your securities.

The Automatic System

has done this for others. It can do it for you.

AUTOMATIC ELECTRIC COMPANY

CHICAGO, ILL.

We offer, subject to prior sale

$42,500.00

Adsit General Electric Company

COMMON STOCK

A Minnesota Manufacturing Corporation (Single Liability).
Authorized Capital, $300,000.00. Par Value, $100.

The Company owns, outright, a thoroughly practical method of supplying private telephone service on all present Party Lines, both City and Rural. Such service is made possible through a simple, moderate priced attachment, called a "Lock-Out." The device is adaptable to any style phone. There are 5,000,000 telephones in the United States today demanding this equipment. The Company has practically a monopoly with a world-wide field.

The prospects of this Corporation closely parallel that of the original Bell Telephone Company whose stock was offered at one time for $10.00 per share, and which today is worth over $5,800.00 per share, and none for sale.

There is enough business, in actual orders now on hand, to return better than 11% on the money invested. Conditional orders now booked equal to 27½% net earnings.

Present demand for machines far in excess of the supply. Some orders 90 days old. Additional capital being used to increase manufacturing facilities to the point where shipments can be made promptly.

The allotment of a small amount of this stock for public subscription presents probably the greatest opportunity offered in recent years to moderate sized investors in the telephone world.

This security is recommended as an investment containing great potential possibilities of sudden enhancement in value—yet safe and conservative.

DEPOSITORIES:

MERCANTILE STATE BANK, Minneapolis.
SCANDINAVIAN AMERICAN NATIONAL BANK, Minneapolis.
STATE BANK OF BELVIEW, Belview, Minnesota.

Price per share, $105.00.

Mail subscriptions filled strictly in the order of their receipt.
Delivery at once.

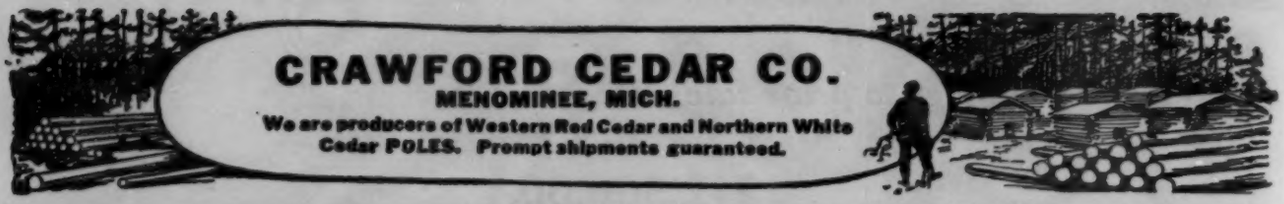
If oversubscribed, shares will be allotted pro-rata and surplus remittance returned on delivery of stock.

Regional Bond & Investment Co.

A special office maintained during this sale at

926 McKNIGHT BUILDING, MINNEAPOLIS, MINN.

Make all checks, drafts and money orders payable to the Regional Bond & Investment Co.



CRAWFORD CEDAR CO.
MENOMINEE, MICH.
We are producers of Western Red Cedar and Northern White Cedar **POLES.** Prompt shipments guaranteed.

Duluth Log Company **POLE SERVICE** **Duluth, Minnesota**

NORTHERN-WESTERN CEDAR POLES
A FULL ASSORTMENT OF SIZES
PROMPT SHIPMENTS ASSURED
T. M. PARTRIDGE LUMBER COMPANY
Lumber Exchange MINNEAPOLIS

CEDAR POLES
Northern White Cedar Western Red Cedar
Butt Treating
PAGE & HILL CO., Minneapolis

CEDAR POLES
Producers and Wholesalers
Large Stock to Supply Every Demand
GET OUR PRICES
Larson Bros. Lumber Co., Minneapolis, Minn.

POLES OF
STERLING QUALITY
Oldest Cedar Pole Firm in Business — Producers for 35 years
MICHIGAN AND WESTERN CEDAR
W. C. STERLING & SON COMPANY
1880 MONROE, MICHIGAN 1915

We Want Your Pole Orders
QUALITY? Idaho, Michigan and Canadian Cedar. The Best that grow.
PRICES? Remarkably reasonable!
SERVICE? Immediate shipments—any quantity! Poles in *stock.*
No matter where you are, our yard locations and shipping facilities make it possible to reach you in a hurry.
THE F. BISSELL COMPANY, Toledo, Ohio

POLES
Complete assortments. Direct Service.
Prompt shipments. Write us.
MELONEY BROS., Spooner, Minn.

"NAUGLE" POLES
Plain or Butt Treated. Largest Stocks.
READY FOR IMMEDIATE SHIPMENT
NAUGLE POLE & TIE CO.
Main Office: 5 South Wabash Ave., CHICAGO

TOOLS
for all classes of electrical construction and repair work. Write for catalog.
Mathias Klein & Sons Canal Station 34 Chicago

SAVE MONEY ON YOUR REPAIR WORK
We do "dependable" telephone repairing. Before you buy new equipment to replace the old let us show you how to make the present last several years more. You will save a liberal margin by doing business with us, and we guarantee satisfaction.
DEPENDABLE MFG. COMPANY, Sharples Bldg., CHICAGO, ILL.

From **POLE** to **POLE**
you will find none better than the
IDAHO CEDAR POLES
We produce in our own Forests.
Sound in Quality. Right in Price.
Large Stocks. Quick Service.
Sandpoint Lumber and Pole Co.
Sandpoint, Idaho

Tells which way and how far trouble is from tester without opening the line.

Thousands of them used.
Get in line and order one on trial. Write today.
STEWART BROS. **OTTAWA, ILL.**

THINK WHAT THIS MEANS

PROTECTION WITHOUT GROUNDS

SERVICE UNINTERRUPTED BY LIGHTNING

I-G Arresters

Save you dollars of useless livery expense by keeping your lines free from lightning troubles. For use on toll and rural lines. Particularly adapted for Phantom lines, both rural and toll.

Write us for information.

The first one hundred telephone companies who wish to try this lightning arrester will receive a sample free, postage paid, by answering this ad.

INSULATOR ARRESTER CO., DULUTH, MINN.

Automatic Telephony

A Comprehensive Treatise on Automatic and Semi-Automatic Systems

By ARTHUR BESSEY SMITH, E. E.
Member A. I. E. E., formerly Professor of Telephone Engineering, Purdue University

ND

WILSON LEE CAMPBELL, E. E.
Fellow A. I. E. E.

The first book published relating exclusively to automatic systems
406 pages, 6x9, illustrated. $4.00 (17s) net postpaid

For Sale by

TELEPHONY PUBLISHING CO.
MONADNOCK BLOCK, CHICAGO, ILL.

The Wheel

No one knows who invented it, or how many thousands of years ago, but its principle was right when it started.

The principle of Matthews Anchor was right when we placed it on the market over 15 years ago. Many minor improvements have been added to it from time to time, but the original principle will be there a thousand years hence.

Undoubtedly many attempts have been made to get out something to take the place of the wheel. With the exception of the sled, in countries where long snowy winters prevail, it is the most economical contrivance for its purpose.

There is also a place where Matthews Anchors cannot be used with economy. It is not economical to use them in rocky ground. They can be used with economy everywhere else—in clay—loam—sandy soil—dry sand—quicksand—under water—in lawns.

Matthews Anchors have no parts to assemble—nothing that requires supervision and inspection before installation — your inspector can tell instantly by looking at the protruding rod of the installed anchor —the size of the anchor used, its depth of installation and whether it was properly installed.

Nine out of ten Electrical Supply Jobbers can ship them from stock.

Ask the Jobber's Salesman to show you the Cake in Matthews Anchors.

W. N. Matthews & Brother
Incorporated
Manufacturers
3718 Forest Park Boulevard
St. Louis

Canadian Distributors

Northern Electric Co., Ltd.
Montreal Halifax Toronto
Winnipeg Calgary Regina
Victoria Vancouver

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Reliable Copper and Iron Sleeves Make Perfect Mechanical and Electrical Connections Between Wires.

The old-fashioned splice made by twisting the ends of copper wires together often weakens wires, resulting in frequent breaks and in high resistance connections.

The old-fashioned splice when made in galvanized iron wire has tendency to break off galvanizing, leaving bare wire exposed to action of air and elements.

Reliable Connectors exclude all air and moisture and make a perfect line. Made in all sizes and combinations.

We manufacture Mica Fuses, Tubular Line Fuses, Cable Terminals, Hangers and Switchboard Protection.

Send for our new catalog

RELIABLE ELECTRIC COMPANY

411-417 S. Sangamon St.

CHICAGO

AMERICAN CROSS-ARM CO.

CHICAGO

OKONITE

TRADE MARK REG. U.S. PAT. OFFICE.

OKONITE

INSULATED

WIRES & CABLES

The STANDARD for RUBBER INSULATION

THE OKONITE CO., 253 Broadway, New York

WESTON

Wire Chief's Voltmeter

The Weston Model 57 Voltmeter has been developed especially with reference to the requirements of Telephone Companies. There has been reported, as a result of its use in stations,

A 25 per cent. increase in efficiency

With this instrument, the Wire Chief can make rapidly and accurately a large number of the tests of lines necessary to locate defects and determine their nature. With its assistance, he can keep the systems under his charge up to the highest standard of efficiency. The Weston Model 57 Voltmeter conforms in every way with the Weston standard of construction, which means that it provides the maximum of accuracy, durability and convenience in use. Write for descriptive circular.

Weston Electrical Instrument Co. - Newark, N. J.

New York	St. Louis	Detroit	Richmond	Vancouver
Chicago	Denver	Cleveland	Toronto	Berlin
Philadelphia	San Francisco	Buffalo	Montreal	London
Boston		Atlanta	Winnipeg	

This Tag Identifies the Genuine

There is a difference in Drop Wire. Ask any of the many telephone companies who have adopted Ironite. We attach this tag to protect you. Insist upon seeing it.

Get the highest efficiency, with minimum expense by installing

IRONITE

The Ideal Duplex Drop Wire

Easy to handle—trouble-proof—weather-proof—costs less than copper.

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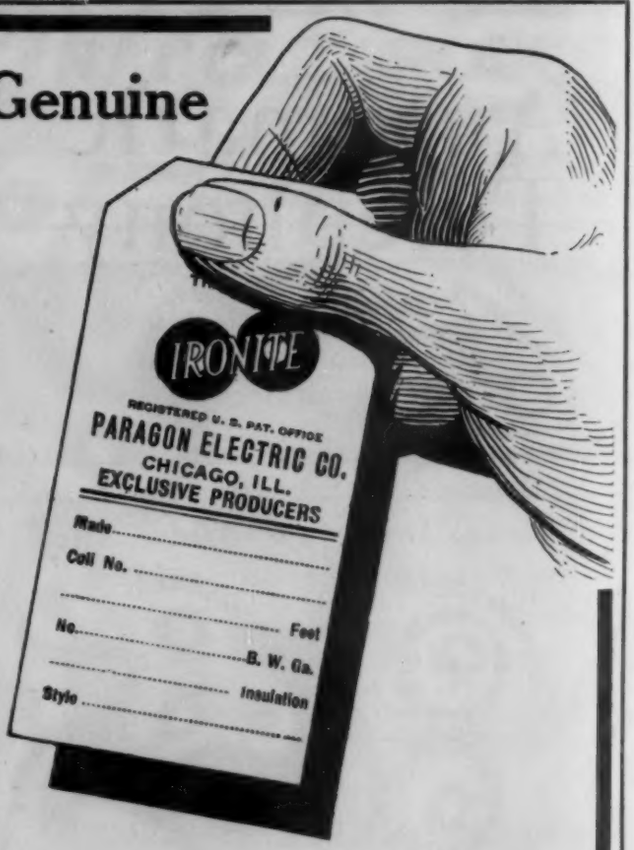

PARAGON ELECTRIC CO.

Madison Terminal Bldg. Chicago

610 First Ave., Seattle 212 W. Third St., Lo Angeles
86 Third St. San Francisco

Central Electric Supply Company, Limited, Toronto
Agents for Ontario

Houston & Co., Ltd., Winnipeg, Agents for Manitoba

Telephony.

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BEST METHODS NOT ALWAYS BEST.

The best methods of yesterday may not be the best methods today or tomorrow. New conditions are making. Every 24 hours, people are older and wiser and more discriminating—life is constantly evolving change.—Charles F. Higham.

A Step in the Right Direction.

In years past TELEPHONY has expended a vast amount of printer's ink condemning the alliance between the Bell telephone interests and the Western Electric Co., and urging that steps be taken to dissolve it. It is, therefore, gratifying to call attention to the action of the board of directors of the National Independent Telephone Association, at its meeting in Chicago, March 20. A resolution was unanimously adopted, declaring that the alliance is "unfair to the interests of the public and the telephone industry," but we are glad to note that the directors did not stop there. Resolutions have been adopted before, but have neither scared the offenders nor accomplished any material good. The meeting voted to create a committee to investigate the relations between the Bell and its manufacturing branch, and it was the sense of the conference that no time should be lost in getting the matter before the proper authorities, so that this unfair trade condition can be abolished.

This certainly is a step in the right direction. Like all steps, however, it must be followed by others, if any real progress is to be made. Nobody with the most casual knowledge of the telephone situation needs to be told that the Bell-Western Electric combination has been a sore spot in the telephone industry of the United States. It has led to countless cases of injustice, and created a condition that the awakening conscience of the American people has decreed must cease.

The spectacle of a big holding corporation, including a large number of public utility companies, owning a manufacturing concern from which those companies are compelled to buy equipment, is an incongruous blot on the plans for fair dealing that the business men of today are demanding. Not only does the American Telephone & Telegraph Co. virtually insist on Bell operating companies buying from the Western Electric Co., *but it closes their doors to Independent manufacturers, and yet directs the Western Electric Co. to sell to Independent operators.*

It requires no keen insight to see the gross unfairness in this situation.

As TELEPHONY has before pointed out, the Bell should either permit its operating units to buy in the open market, or else cease its factory operations in the Independent field.

The committee in charge of this matter is instructed to investigate this situation. Little is needed. All that is necessary is to collect the evidence that abounds on every hand. The important thing is to present the facts and neglect no time nor energy in forcing action. If the doctrine and principles regarding fair dealing in business, which have been preached at Washington for the last few years, are worth attention at all, there should be no doubt of relief being granted.

The association committee will have no difficulty in showing how hoggish the Bell has been in trying to grab both the operating and manufacturing business, and keeping up the bars against the Independent dealers, whose customers the Bell has by all means sought to pull to its Western Electric ally. Surely the federal government, represented by the Interstate Commerce Commission, the Federal Trades Commission and the Department of Justice, will see this glaring wrong righted.

Unfair Methods.

Attention of Independent telephone men is invited to the article in this issue entitled "The Bell System in Washington, D. C." written by A. P. Connor. Mr. Connor is an electrical engineer and attorney-at-law in the national capital, and has given the telephone situation there careful thought and study. He points out the fact that government

telephone specifications are drawn in such a way that nobody but the Bell manufacturing concern, the Western Electric Co., has any chance to secure a contract, and that the Bell system and the Western Electric Co. are combined and intermingled in a way which has done, and is doing great harm to Independent telephone interests, without, apparently, any legal standing to support such a situation. The Bell-Western Electric operating alliance should be served as was the Bell-Western Union alliance.

Mr. Connor says the ways to bring about these results are through the courts, through legislation, through the Department of Justice, the Interstate Commerce Commission, and by bringing the matter to the attention of Congress for investigation. He points out several methods of procedure by Independents in the bids now pending, which, if successful, would open up a great field for the whole telephone industry and to the great benefit of the government.

There is much food for thought in Mr. Connor's article, and action in the matter should be taken by both the national telephone associations to correct such evils and bring about a dissolution of the American Telephone & Telegraph Co.-Western Electric Co. unfair alliance.

You're Due for the Dry Dock

By HERBERT KAUFMAN

It doesn't take us long to get rid of visible dangers. The small beasts outlasted the grotesque monsters. Our greatest menaces are infinitesimal. We've never had to ponder long over ways and means to cope with apparent problems. But man is constantly called upon to combat the invisible and silent perils, lurking where eye and hand cannot reach them. Foremost among the enemies of human weal are the forces of disease and decay.

Efficiency demands cleanliness. Our mightiest works are at the mercy of the tiny, persistent organisms. Even a dreadnaught is endangered by foulness. A battleship that isn't regularly overhauled, will eventually be overtaken.

The terrific engines that hurl steel fortresses across the oceans are checked and restrained by masses of puny marine growths. Crack cruisers can only maintain their maximum speed so long as their bottoms are kept clear of barnacles. From time to time they must enter the dry dock and undergo a thorough scraping. Barnacles—literal and figurative—impede action, reduce strength, and retard progress.

The boiler has not yet been built which does not demand regular cleansing. Every manufacturing plant is forced to shut down at intervals for general inspection and restoration. Even the ponderous equipment of rolling mills is vulnerable to dust and rust.

How, then, can you evade the consequences of neglect? What chance does an incautious human stand against the forces forever watching for an opportunity to conquer man himself?

Keep clean! Health is impossible without care. You put money aside for a rainy day. You maintain a savings account in anticipation of old age, but how much vigor have you banked? How much vitality have you stored up to oppose disease?

All men must occasionally enter the dry dock for overhauling. We all accumulate scale in our boilers and choke our systems with deadly waste.

No foreman would tolerate a workingman who abused his machinery as badly as you treat yourself.

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The Board of Directors of the National Association Meet

Discuss Plans for Ensuing Year at Hotel La Salle, March 20, 1915—Resolutions Passed Condemning the Bell Toll Contract Agreement and the Relationship Between the American Telephone & Telegraph Co. and the Western Electric Co.

A meeting of the board of directors of the National Independent Telephone Association was held at the Hotel La Salle, Chicago, on March 20, 1915, with the following members of the board in attendance: C. Y. McVey, Cleveland, Ohio; L. D. Kellogg, Chicago; A. F. Adams, Kansas City, Mo.; H. B. McMeal, Chicago; W. C. Handlan, Wheeling, W. Va.; A. G. Bean, Elyria, Ohio; L. E. Hurtz, Lincoln, Neb.; H. D. Critchfield, Chicago; Samuel W. Harper, Pittsburgh, Pa.; Samuel G. McMeen, Columbus, Ohio; J. B. Earle, Waco, Texas, and Terry W. Allen, Jackson, Tenn.

After a general discussion on accounting, a committee of three was appointed to co-operate with other committees in dealing with the Interstate Commerce Commission to assist in working out a system of accounting which would be uniform and best fit the needs of the operating companies. The committee appointed is composed of LeRoy G. Parker, Columbus, Ohio, chairman; C. A. Bennett, Kansas City, Mo., and E. A. Howard, Wheeling, W. Va.

The financial committee made a partial report and asked that the board allow until the next meeting in order that a full report for the coming year might be made. This committee is composed of Samuel G. McMeen, Columbus, Ohio, chairman; L. D. Kellogg, Chicago; C. E. Tarte, Grand Rapids, Mich.; N. G. Hunter, Wabash, Ind., and A. F. Adams, Kansas City, Mo.

The question of the policy of the association for the present year was fully discussed and Samuel G. McMeen, of Columbus, Ohio, talked at considerable length on the advantages and necessity of a comprehensive, well-defined platform for the National association for 1915. Following the motion of Mr. Handlan that a committee of five be appointed to draw up a declaration of principles for the association, the chair appointed a committee composed of the following: H. B. McMeal, Chicago, chairman; A. F. Adams, Kansas City, Mo.; Samuel G. McMeen, Columbus, Ohio; A. G. Bean, Elyria, Ohio, and W. C. Handlan, Wheeling, W. Va.

This committee submitted the two following resolutions and will report on the declaration of principles at the next meeting of the board of directors:

Whereas, the American Telephone & Telegraph Co. has not carried out the spirit and intent of the stipulation with the Federal government under its letter of December 19, 1913,

And, whereas, the toll connection agreement now offered to Independent telephone companies is grossly unfair,

Now, therefore, be it resolved:

That a committee of three be appointed to confer with the Department of Justice and the Interstate Commerce Commission with the view of securing a fair toll connection contract, and if suitable action cannot be obtained under present conditions, that this committee be instructed to work for the enactment of such physical connection laws as will secure interstate long distance connections for Independent telephone companies under the supervision of the Interstate Commerce Commission.

Resolved that in the opinion of the board of directors of the National Independent Telephone Association the now existing alliance between the American Telephone & Telegraph Co., and the Western Electric Co. is unfair to the interests of the public and the telephone business.

After a general discussion both resolutions were adopted by a unanimous vote of the board.

It was moved that committees be appointed on these resolutions. The president asked for more time to consider the appointment of the committee having in charge the Bell toll contract agreement, as the work of this committee is one of the most important things with which the board will have to deal. This committee will be appointed at the next meeting of the directors.

The committee authorized by the resolution referring to the relationship between the American Telephone & Telegraph Co. and the Western Electric Co. was appointed as follows: H. B. McMeal, Chicago, chairman; L. D. Kellogg, Chicago; W. Roy McCanne, Rochester, N. Y.; H. D. Critchfield, Chicago, and A. G. Bean, Elyria, Ohio.

Upon motion of Samuel W. Harper, of Pittsburgh, a committee of five was appointed to continue the "get together movement" between the Independent Telephone Association of America and the National Independent Telephone Association. The recommendation was made that the two old committees heretofore appointed be discharged. This was done and the following committee then appointed: H. D. Critchfield, Chicago, chairman; A. F. Adams, Kansas City, Mo.; H. B. McMeal, Chicago; F. B. MacKinnon, Washington, D. C., and C. Y. McVey, Cleveland, Ohio.

It was the sense of the meeting that each member of the board of directors should use his untiring efforts to bring about the consolidation of the two associations, believing that the best interests of Independent telephony will be served by one national organization.

After a general discussion of the telephone situation, the board adjourned to meet within 30 days upon the call of the president.

Telephone Inquiry in New Jersey.

New Jersey has followed the lead of New York in setting in motion legislative machinery for an investigation of telephone rates and company methods in the state. The initial step was taken by Assemblyman Hughes, who introduced a resolution in the New Jersey House, providing for a special committee of five to investigate telephone charges and the effect of and obedience to orders issued to telephone companies by the New Jersey Public Utilities Commission.

Assemblyman Hughes based his action on alleged complaints against exorbitant telephone charges. A hearing was held Monday, at which vigorous representations against the procedure were made in behalf of the New York Telephone Co. and the Delaware & Atlantic Telegraph & Telephone Co. The New York Telephone Co. operates in New Jersey in the counties of Bergen, Essex, Hudson, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex and Union and a portion of Ocean, while the Delaware & Atlantic company, which is a subsidiary of the Bell Telephone Co. of Pennsylvania, in turn controlled through stock ownership by the New York Telephone Co., operates in the southern part of New Jersey.

John L. Swayze, general counsel for the New York Telephone Co., appeared before the special committee appointed under Assemblyman Hughes' resolution for an investigation into telephone rates charged in New Jersey, for

As previously stated, the value of the physical property and out that the two companies owned between $35,000,000 and $40,000,000 worth of property devoted to public service, with approximately 187,000 subscribers, operating in practically every community in the state of New Jersey and providing the people of that state with its telephone service.

Mr. Swayze declared that the state has a board of public utility commissioners who are charged with the duty of regulating all public utility companies, including telephone companies, and who have an organized staff of assistants. This board, he said, could not do the work that is provided in the resolution and the other work with which it is charged, without increasing its force materially and spending a very large sum of money. He pointed out that the commissioners are now conducting an investigation of electric light rates which has cost the state already about $80,000 and is yet far from completion.

If it were decided to take the matter out of the hands of the public utility commissioners, it should be done in an orderly manner. A joint resolution should be introduced, he declared, providing for a thorough investigation and for an appropriation which will allow the committee appointed to do its work and carry on the investigation in a thorough, orderly and efficient manner.

Hearing in Maryland Telephone Investigation.

The figures presented by People's Counsel Osborne I. Yellott, at the hearing held last week in the investigation of the Chesapeake & Potomac Telephone Co. before the public service commission, show that the company is claiming approximately $18,500,000 as the value of all its property in the state of Maryland. Mr. Yellott's valuation is approximately $11,250,000, a difference of about $7,250,000.

The balance is a difference as to what shall be taken off the value of the company's physical property to cover depreciation and a difference as to what shall be allowed the company for undistributed overhead costs.

The value of the physical property and the rights of way of the company have been agreed upon by the representatives of the people and the commission, through the plan devised by Mr. Yellott. Under this plan complete inventories were made of all classes of the company's property by both sides, and values were given to each unit of the property. By taking up the inventories one by one the two sides were able to ascertain the causes of such differences as appeared, and, finally, to eliminate them.

In connection with the value of the physical property, it may be said parenthetically that the present investigation places a valuation upon physical property and rights of way in Baltimore city alone of $5,396,000, as against a valuation of $5,665,000 in the previous investigation. In the several years since the first investigation the Chesapeake & Potomac company claims to have added largely to its city property.

A summary of the company's figures as to the value of the property follows:

Physical property		$10,115,000
Rights of way		348,000
		$10,463,000
Undistributed overhead costs		2,054,000
		$12,517,000
Less 10 per cent. depreciation		1,252,000
		$11,265,000
Working capital		500,000
		$11,765,000
Development costs		4,653,000
		$16,418,000
Easements		2,100,000
		$18,518,000

As previously stated, the value of the physical property and the rights of way has been agreed upon by both sides, as $10,463,000.

The company's claim for undistributed overhead costs is about 19.63 per cent. of the value of the physical property. This, Mr. Yellott holds, is too high. He contends that a part of the undistributed overhead costs is included in the value of the physical property, because of the manner in which the value of this physical property was determined under his plan.

The company's claim that the property is 90 per cent. good, or, in other words, that it has depreciated but 10 per cent., will be fought by Mr. Yellott, who holds that the depreciation is greater. The claim for $250,000 working capital will be fought, on the ground that the company's credit is so good that a large working capital is not needed, and also on the ground that the company requires payments in advance from subscribers, thus again reducing the need for working capital. Mr. Yellott contends that $250,000 is ample for the Chesapeake & Potomac company.

The next item in the summary is the general claim for development cost—$4,653,000. Mr. Yellott believes that an allowance for development cost and preliminary organization may be permissible, but he is not prepared to concede any early losses. He expects to stand for $500,000 as a proper allowance under this head.

Mr. Yellott thinks that if the proper figure is ascertained it may be better to authorize it than to include it in the capital. If authorized, the company would be allowed to earn a certain sum each year for a given period of years, the total of which would be sufficient to liquidate the amount. It is suggested that this would be better than including the sum in the total valuation—that is, in the total capitalization—which would stand for all time as against the public, who must pay the company revenues on is capitalization.

The easement claim for $2,100,000 will be opposed by Mr. Yellott in its entirety. Most of the easements of the company cost nothing, and the balance very little.

In addition to the property summarized, the Chesapeake & Potomac company claims $3,000,000 to cover the cost of the old Maryland Telephone Co., which it purchased. Mr. Yellott thinks that the property should not be carried at more than its actual value, which, it is contended, is less than $500,000. The Maryland Telephone Building is the chief asset in this claim.

During the fiscal year 1913, for which these figures stand, the Chesapeake & Potomac company earned in the entire state $3,349,000 gross. It had operating expenses of $2,691,000, leaving net profits of $658,000. If Mr. Yellott's valuation of $11,250,000 is decided to be the proper one, the net earnings for that year will be at the rate of something less than 6 per cent. That would mean, probably, that the revenues of the company would not be decreased.

However, it does not follow that certain rates will not be decreased, for it may be found, for example, that Baltimore city is earning largely over 6 per cent. for the company, while other parts of the state are earning less. Mr. Yellott expects to show clearly the earnings from the different classes of subscribers and the different territories.

Regulation of Proximity of Transmission Lines.

The lower house of the Wisconsin legislature has favorably advanced the Frederick bill giving the railroad commission power to regulate the proximity of transmission lines to telephone wires. Where these wires have already been strung and transmission lines interfere with telephone wires, the commission may order a change of methods of operation apportioning the cost between the parties at interest. The Frederick bill has the approval of the railroad commission.

Practical Telephone Suggestions for Exchange Men

A Series of Short Articles Dealing with Important Phases of Telephone Work—Kinks Relating to Supervising Equipment for Manually Operated Switchboards—The Standard Supervisor Equipment and an Overhead Connected Supervisor's Circuit

By Ray H. Manson

The following series of articles on "Practical Telephone Suggestions" is a continuation of a similar series which appeared in TELEPHONY in 1907 and 1908, under the heading of "Manson's Practical Suggestions." Each subject is complete in itself and covers schemes and methods which have been tried out in practice and found of value.

The data for many of the subjects has been furnished the author by progressive operating men. Like "tested

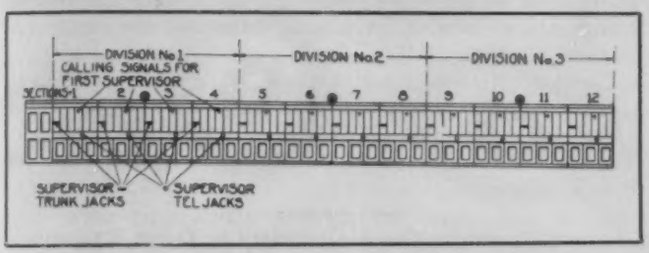

DIVISION No.1
CALLING SIGNALS FOR FIRST SUPERVISOR
DIVISION No.2
DIVISION No.3
SECTIONS 1 2 3 4 5 6 7 8 9 10 11 12
SUPERVISOR TRUNK JACKS
SUPERVISOR TEL JACKS

Fig. 1. Standard Arrangement for Supervisor-Operator.

recipes," these suggestions all have a positive value and can be safely adopted when the particular scheme applies to the reader's individual requirements.

An Efficient Switchboard Monitoring System.

One of the advantages offered through the manually operated switchboard is the "personal element" at the exchange in the form of operators for assisting the subscribers in getting and maintaining the desired talking connection with other subscribers.

The Standard Supervisor Equipment.

In small exchanges, the chief operator performs also the duties of the supervisor, information clerk, etc., with efficiency. When the switchboard is of considerable size, with four or more sections equipped, special operators usually are employed to supervise and assist in the work of the local operators. System is required here as in all other exchange duties, so the supervisor-operators are assigned to specified divisions of the switchboard. For example, a switchboard of 16 sections of three positions each, is divided into four divisions of four sections each, one supervisor being assigned to each division.

Ordinarily the supervisor operator covers her particular division of the switchboard without any electrical connection to her telephone set. When the supervisor's attention is desired, it is obtained through a suitable pilot signal located in the face of the switchboard and by means of a single stroke gong. The supervisor makes connection to the switchboard circuits through a special jack usually located in the middle or at the right end of each section, this jack being wired to multiple trunk jacks in each of the switchboard sections of that particular division. Multiple jacks connecting with all other divisions of the switchboard are provided in each section so that the local operator can call another supervisor when the supervisor operator for that particular division is busy. By means of these supervisor trunk jacks, connections can be established between subscribers and the supervisor for information calls, complaints, etc.

It will be noted that the supervisor is required to reach in between regular operators in order to make electrical connection to the switchboard circuits through the plug and jack. Furthermore, it is necessary to remove this cut-in plug as soon as her particular duties are performed, in order to be available for other duties in the several sections of her switchboard division.

The standard supervisor's switchboard layout is shown in Fig. 1. The calling signal lamps for the supervisors are located in the center and at the top of each section, while the cut-in jacks for the supervisors are in the front edge of the key shelf and at the right of the middle operator of each section. The multiple jacks connected to these circuits are arranged in each section in the outgoing trunk jack space.

An Overhead Connected Supervisor's Equipment.

At least one progressive operating company has overcome the delays incident to calling the supervisor-operators through the methods just described, by having a permanent electrical connection through suspended cords to the supervisor's telephone sets at all times when on duty. Each supervisor then, is instantly available without resorting to the ordinary signaling methods and the subsequent plugging into the jacks on the front of the key shelves.

All the supervisor's circuits normally are connected with an order circuit (Figs. 2 and 3) whereby they are able to communicate with each other at any time, making it very efficient to locate accidental disconnects, passing information, tracing "lost calls," etc.

The circuits are so arranged that when the local operator desires the attention of the supervisor in her division, she plugs into the supervisor trunk jack. This places her in direct communication with the supervisor and at the

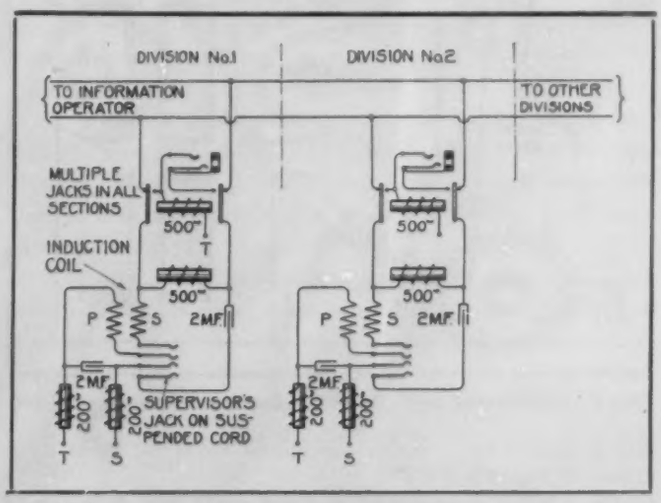


Fig. 2. Overhead Connected, Two-Wire Board.

same time disconnects that supervisor from the circuit of the other supervisors. If her supervisor is busy, the operator takes the first idle supervisor, ascertained by taking the busy test.

The local operator also may establish direct connections between subscribers and supervisors, for information calls, complaints, etc., in the regular manner. Upon the opera-

tor disconnecting, the supervisor is again restored to the supervisor's order circuit.

The scheme is to quicken the monitoring service and incidentally to make it possible for each supervisor to do more work than otherwise. It is claimed that this method gives an

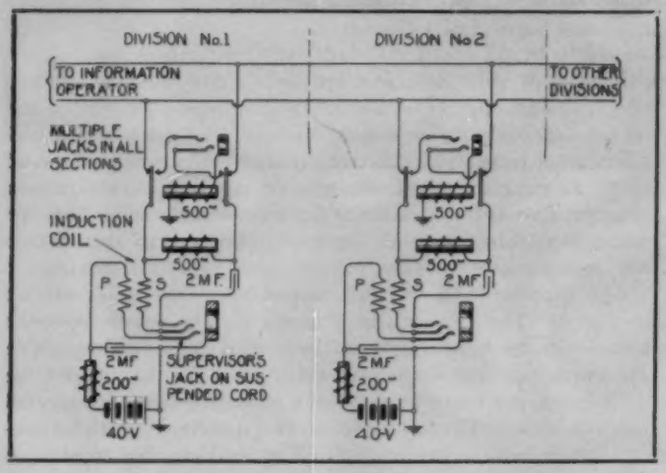


Fig. 3. Overhead Supervisor's Circuit, Three-Wire Board.

increase in efficiency of about 25 per cent. over the ordinary monitoring scheme.

Fig. 2 shows the circuit for a two-wire multiple switchboard, while Fig. 3 is for a three-wire system. The apparatus is duplicated for each supervisor's set throughout the switchboard. The cut-off relay, retardation coils, condensers and the induction coil for each division can be neatly mounted on a wooden base and located inside of the switchboard cabinet and above the multiple cables.

The circuit extends from this equipment, by means of a four-conductor flexible cord, through a tubular arm or conduit which projects about four feet from the top of the switch-

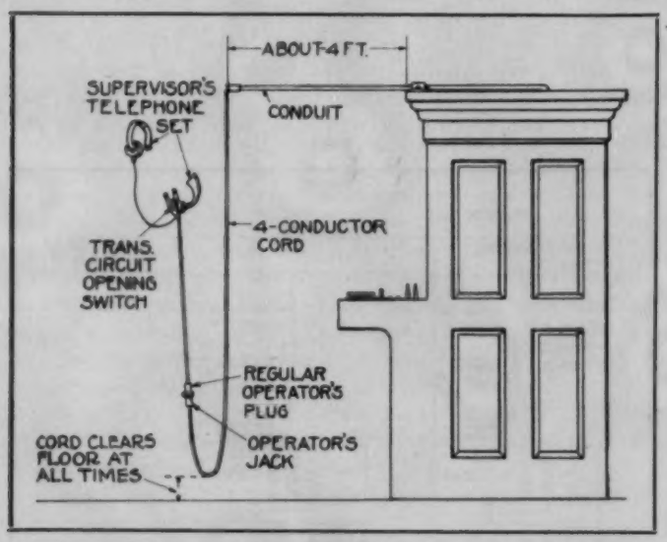


Fig. 4. Switchboard with Overhead Connected Supervisor's Set.

board cabinet and over the operators' heads. This is illustrated in Fig. 4.

The conduit is placed in the center of each division and the cord is made of sufficient length to permit the supervisor to walk the full length of her division without straining the connection. If the end of the conduit is properly arranged, the supervisor will have complete freedom within her division and at no times will the cord drag on the floor.

The supervisor's telephone set is the same as that employed by the local operators, excepting that a switch is mounted on the base of the breast plate for cutting out the transmitter, as shown in Fig. 5. The transmitter circuit is closed only when the supervisor has occasion to talk through her circuits, thereby avoiding all foreign noises in the common order circuit.

The suspended cord is provided with a special cut-in jack and the supervisor's set is equipped with a regular operator's plug. The supervisor can connect and disconnect from the special circuit when going on and off duty in her division, and also has her cut-in plug available for plugging into any operator's position jack on the switchboard in case of emergencies.

Another feature shown in the circuits, Figs. 2 and 3, is the extending of the supervisor's common multiple circuit to the information operator's desk. This allows the information operator to connect instantly with the supervisors at any time.

In place of the fixed conduit arm for supporting the supervisor's telephone cord, an overhead trolley has been adopted in at least one exchange, the circuit connections being substantially as previously described for the former method.

Considerable care must be taken when adding equipment to existing switchboards so that the completed job will be systematically arranged and present a finished appearance. This will assure freedom from subsequent troubles in operation.

Expert Operators Coach Operators in Other Exchanges.

The officers of the Central Home Telephone & Telegraph Co., of Louisville, Ky., have developed a system of making use of expert chief operators in certain of the exchanges of the system as teachers for operators in other of the exchanges.

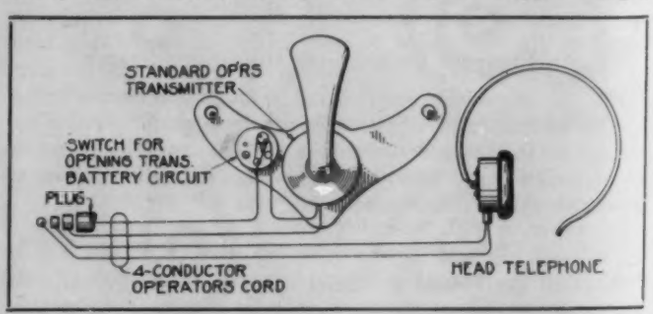


Fig. 5. Supervisor's Set for Overhead Connected Circuit.

The purpose of this plan is to speed up the service in the offices which are not coming up to the mark set by the more progressive exchanges. In this work in the Central Home system, Miss Clyline Lusby, chief operator of the Paris, Ky., exchange, is proving exceedingly useful, having developed her own exchange to a high state of efficiency.

Miss Lusby is at present at work in the Russellville, Ky., exchange of the Central Home company, where she is teaching the local operators the kinks which make for efficient service, and coaching the girls there in the ways of expert service. From Russellville, provided the affairs at the Paris exchange continue to run smoothly, as there is every reason to believe they should, Miss Lusby will go to Owensboro, Ky., to conduct a practical school for the operators there.

Miss Lusby has given excellent service of this same character in numbers of the exchanges of Central Kentucky and also at Bowling Green and the efficient service being given by the Central Home long distance wires and the local exchanges, the officials state, is credited in a large degree to her good work.

La Fayette (Mo.) Company Opens New Exchange.

The La Fayette Telephone Co., of Lexington, Mo., recently celebrated the opening of its new exchange on Franklin Street. During the hours announced for the opening, crowds of visitors thronged the new building.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties —Prepared Under the General Supervision of Stanley R. Edwards—This Section on Economics of Telephony written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

1. What proof does President Butler, of Columbia University, give for his declaration that scholarship, science, literary attainment and literary reputation are no guarantee of common sense and that they are useless as guides to good conduct and ordinary decorum? In addition to the complaints made relative to the shortcomings of utilities, what other departments of human endeavor are now being called to account? What class of undertakings is singled out and compelled by law to be perpetually and increasingly serviceable to the public?

2. What reasons can be given for saying that telephone must lead in the struggle to get out of the world's present economic perplexities?

3. What was the most important principle set forth by Adam Smith and the earlier economists?

4. What is the difference between the requirements imposed by law upon a utility and the legal requirements imposed by law upon other lines of endeavor? What are the only two wrongs of which the average utility man need be ashamed?

5. What delusion is the utility owner apt to have? In the operation of his plant, what must the utility man do before he can get away with an unfair amount of profit?

6. What must the telephone man master before he expects to be free from confusion?

CHAPTER ONE. Introduction (Continued.)

7. *Definitions.*—It frequently happens that disputants fail to agree in advance as to the exact value or meaning of every word they are to use. It has been pointed out that, for this reason, most arguments are a total waste of time. As a remedy for this waste of time it has been suggested, that, before beginning the discussion of any subject, an honest effort be made to reach a thorough understanding and to establish a complete agreement as to definitions. As a rule, when the purely imaginary differences of opinion have been thus cleared away, nothing is left of the supposed disagreement. When all controversies that are due to differences in the use of words have been cleared away, the other half of the time of the argument is saved.

In approaching the subject now to be considered let us, therefore, first of all, agree as to the meaning of these five terms, viz.: 1. Economy in the ordinary sense. 2. Theoretical economics. 3. Practical economics. 4. Utility economics in general. 5. Telephone economics in particular.

8. *Economy.*—Economy means "Carefulness as to outlay; frugality in expenditure." It also means "A system of principles; a scheme of laws as is implied in the phrase 'household economy.'" It is in this last named sense that we use the word when we speak of "political economy."

9. *Theoretical Economics.*—The teachings of the earlier economists are sometimes referred to as "theoretical political economy." This is done to distinguish them from certain ideas which are being advanced today.

Wealth was the only object of interest to the first students of political economy. As used in those earlier days, wealth meant "everything having exchangeable value," "everything to obtain which something will be given in exchange." In fact it must be observed that many still have this same original understanding. Many still speak of wealth as including everything which has exchangeable, or property, value.

Supply and demand seem to have been looked upon by early economists as being Providentially controlled. Supply and demand appear to have been looked upon as a law or force that could be safely trusted to protect the public's need. Early economists confidentially relied upon supply and demand to regulate self-interest. They seem to have rested in a confident assurance that there was no such thing as sentiment in business; and, no need, therefore, of taking sentiment into account when considering economics.

The early (theoretical) economists appear to have been confident that there need be no exceptions to the rule of "let the buyer beware;" no need of any exceptions to the rule of "charging all the traffic will bear."

10. *Practical Economics.*—Practical political economy takes into account such things, for instance, as lottery tickets and opium. According to the teachings of practical economists, human experience proves that the law of supply and demand does not always satisfactorily control self-interest; that the law of supply and demand does not always compel self-interest to benefit the public. Modern economists point to the fact that human experience, public sentiment and man-made laws, have combined to compel the seller to beware. In certain countries, these have combined and are now compelling the seller to beware how he sells lottery tickets, opium and other similar things that are contrary to the common good.

There is a sense in which political economy means simply "the best way that can be found for satisfying the desires of man." It is true, also in a sense that, for the satisfying of man's desires, "the way which costs the least, is the best." To these assertions, all the various classes of economists agree with certain important qualifications.

Difficulty between the theoretical and the practical economists arises when, for instance, it becomes necessary to decide

whether or not any way for the doing of an opium business, on a large scale, can be good enough or cheap enough to win public approval. A disagreement arises when, for instance, men must decide whether certain articles like lottery tickets and opium for which there is an undeniable demand, should be supplied at all. Difference of opinion is encountered when men must decide whether or not market price, or exchangeable value, is the only element that should be considered by economists when figuring economic costs, or when deciding as to economic values.

Practical economists go a step or two further than theoretical economists. The practical economist contends that in estimating economic values, there are other important elements besides market price or exchangeable value which must be taken into account. Theoretical economists treat a lottery ticket and a ticket of admission to a helpful lecture as though both were wealth. They do this because there is as real a market demand for the lottery ticket as for the lecture ticket. Unquestionably there is as real a market price for the one as for the other for both unquestionably have an exchangeable (market) value.

Practical economists admit that in certain countries lottery tickets still command a lawful market price and have a legalized exchangeable value as real a market price as have lecture tickets. But they insist that, from the standpoint of economics, the lottery ticket is a curse to the public, as contrasted to the lecture ticket, which is a benefit. Theoretical economists said: "For the common good, we may safely trust Providence and the law of supply and demand to regulate self-interest." Practical economists on the other hand say: "We find in actual life, certain self-interests which injure the public. Therefore the public or the government should regulate every purpose and practice that is contrary to the common good."

The practical economist says that a lecture ticket is for the common good and for that reason it deserves to be legalized as wealth or property. A lottery, however, even in countries where it has a legalized exchangeable value, is against the common need and for that reason it should be outlawed as "i l l t h." Not only is opium poison as contrasted to bread, which is food, but, even in countries where opium has a lawful market price, it is "b a d s" as contrasted to bread which is "goods." Where the law of the land legalizes private proprietorship over both, bread is good property, or goods, and opium is bad property, or "bads." The practical economists of today state that lecture tickets and bread promote the public's welfare as contrasted to lottery tickets and opium, which promote the public's "i l l f a r e."

11. *Differences beween Theoretical and Practical Economics.*—Theoretical or early economists taught that "Self-interest is the basis of all action" the cause of every effort and endeavor. Because of this therefore, mankind is compelled to trust to self-interest and to "let the buyer beware." Practical or later economists teach that mankind must find out, and establish in actual practice, ways and means for guarding the common good and protecting the public's need. They teach that mankind must guard and protect the common need at all times and in all economic endeavor—no less carefully than in war or in time of war. Therefore every purpose and practice which is found by experience to be contrary to the common good, must be prevented by means of an enlightened and active public interest.

Theoretical economists looked upon enlightened self-interest as the one thing to be relied upon. Practical economists see the need of an enlightened public interest as well. They insist that, in every case of conflict, public interest must be respected as the supreme authority or control and that the common need is master of every purpose and practice.

The difference in the effect of the teachings of these two kinds of economics, upon the minds of two men of prominence, is well illustrated in the following from testimony recently given before United States Commission on Industrial Relations:

> Directors have no responsibility for labor conditions. . . . I do not know whether $10 a week is enough for a man, but if that is all he gets, and he takes it, I should say it is enough. . . . I have no opinion as to the age and conditions under which children should be employed. . . . I have never thought of the length of day a child should work. . . . I have no opinion on child labor, shorter working hours, increased pay or improved conditions.—J. P. Morgan.
>
> I should not consider myself fit to serve as a director if I were not capable of being fair on all questions of labor. . . . The prime consideration of industry should be the well being of the men and women who engage in it. . . . If an official or a corporation should be found to maintain improper labor conditions, we should change the conditions or the official. . . . Sometimes combinations of capital are conducted in disregard of both labor and the public. Such combinations cannot be too strongly dealt with.—John D. Rockefeller, Jr.

Theoretical economists hold that the form of government is best which interfers least with the self-interests of individuals. Practical economists may still agree, in part, with that earlier idea. They agree, also, with that Hebrew philosopher and economist who said: "Governments are ordained of Providence for the punishment of those whose self-interest leads them to do wrong, and for the praise (or encouragement) of those who serve the common need." This may not be the exact language, but it applies Paul's idea of the subject. For certain kinds of self-interest, the up-to-date economist sees the need of governmental regulation as well as Providential over-ruling.

Practical economists agree more particularly with the latter part of the following quotation from an early economist, named Tucker:

> Self-love or self-interest, cannot be extinguished. It might be questioned whether it would be right even to diminish it, for all the arts and sciences and the very being of government and commerce, depend upon this vigorous principle without which human nature would make but feeble efforts toward anything great or good. Benevolence is somewhat of a check on this selfish principle, but it is only a feeble check. Therefore public policy should give to self-interest such direction that it may promote the public interest in the pursuance of is own.

This quotation harmonizes theory and practice. It lays down a foundation upon which all the departments of economics can stand. It unites, not only the modern with the ancient and the practical with the theoretical, but it includes the economics of utilities, as well.

12. *Utility Economics.*—As applied to utilities, political

economy does not differ much, if any, from the teachings of the practical economists. There is, however, a very good reason, an absolute necessity in fact, for separating utility economics, in general, from practical political economy. This is the reason: Practical economics is a course of study. Utility economics is a business. Practical political economy is a science that is being taught in our schools, while utility economics is a part of the everyday affairs of the age in which we are compelled to live.

Practical economists are beginning to teach that certain economic principles ought to be established in the actual practices of every department of human endeavor and ought to be followed by every business. But what is being merely hinted at, taught, suggested, or proposed for other lines of business is already applied, by law, to the utilities. The practical thing for the utility man to do is to satisfy himself, first of all, that this is so.

Is it a fact that in the business of today we have a double standard of requirements? Is the standard that is required by law of the utilities, higher than the standard required of any and all businesses which have not, as yet, been declared, by law, to be utilities?

The next thing in the line of practicability, is to be certain of the most satisfactory reason obtainable as to why this double standard has been established in actual business affairs and to be satisfied as to why a utility is held to this higher standard. Perhaps as good an explanation as can be given is contained in the language of a United States Supreme Court decision, as follows:

> When the owner of a property devotes it to a use in which the public has an interest, he grants to the public an interest in such use; and, therefore, he must, to the extent of that interest, submit to be controlled by the public, (for the common good.)

On December 22, 1914, at the convocation exercises of the University of Chicago, President Van Hise, of the University of Wisconsin, said: "The decisions of the courts show beyond question that when any business has become vested with a public interest, it is subject to regulation precisely as are now the public utilities."

While the regulation of other affairs is being merely discussed, or hinted at, the regulation of utilities is a reality. Let it be observed, also, that the only reason why the one is in actual practice, at a time when the other remains a theory, is this:

The utilities have made themselves so exceedingly useful to the public that the people, through the government, feel the need of exercising control over them.

13. *Telephone Economics.*—Everything said with regard to utility economics in general, applies with full force to the telephone business in particular. In addition, we have certain economic conditions or relationships which are peculiar to the telephone business alone.

Little, if any, interest is taken in the man or institution that does nothing. Some even go so far as to say that one must do nothing, if one wishes to avoid being blamed. Following this same inclination, some utility men rebel against the regulation or interference which national, state and municipal authorities are imposing upon their business. But, as the man who does things must expect to be blamed more, to be blamed more seriously and more often than the mere do-nothing, so the man, firm or corporation that makes himself or itself most useful to the public, must expect to be regulated.

It is because of his extraordinary usefulness that he must expect to have his business regulated by public authority. It is because he has built up his business to the point where it has become a public necessity, that he must submit to being controlled for the benefit of the public.

14. *Regulation Evidence of Usefulness to Public.*—In the writer's opinion, one of the most important things to be learned about telephone economics is that regulation is an honor and not a dishonor. It is an evidence that the thing regulated is useful and not useless. It is a proof that the business thus controlled has made itself exceptionally valuable to all the people. It is unquestionable evidence of exceptional value to the public.

No one has ever heard the remotest hint that the public wants the rails of our transportation systems or the wires of our communication systems dragged out into the sea. With all of its fault-finding, the public does not want any utility destroyed.

Like the baseball enthusiast in the grandstand, the public is inclined to be over-zealous in its demands for perfection. Those who occupy seats in the grandstand find it easy to give loud expression to their disapproval of errors on the part of the pitcher or other members of the team. A grandstander finds it much easier to yell "Get the hook!" than to step into the pitcher's box and do the job as he demands it shall be done.

A man is not a good baseball player until, by experience, he has obtained nerve enough to do his best in the face of flagrant and unreasonable fault-finding. He is not a good player until he becomes absolutely confident that if, under the circumstances, a better pitcher could be found for his place that better man would actually be doing the pitching. In a similar manner, one is not a good telephone man until, by experience, he learns to rest securely and confidently upon his own ability. He must know that much of the fault-finding about utilities is like the grandstander who yells at the pitcher. A great share of the fault-finding comes from a desire on the part of the public for the further advancement of an undertaking that is already more useful than its neighbors.

15. *Utility.*—Utility is "serviceableness" according to the dictionary; and according to law, the telephone is a utility. While he was chairman of the Interstate Commerce Commission, Franklin K. Lane said:

> The primary object of the commission must be to prove the efficiency of the machinery devised by law . . . to make private capital serve public need . . . Within the zone of our power, it is our endeavor to make the utilities supremely serviceable to the public.

In utility economics we have already advanced to the stage where the government is so regulating self-interest as to compel it to be perpetually and increasingly serviceable to the public. In the field of telephone economics, we find certain unescapable forces at work which control the telephone man's self-interest. There are natural forces which prevent the telephone man from satisfying his own self-interest except as he

"serves" the public. In telephone economics less of the materialistic and more of service is found than in any other business.

In the telephone business, natural forces are actually giving the average citizen the very experiences and the schooling he needs to perfect his economic knowledge and to harmonize his economic relationships. As a matter of self-preservation the telephone men of the country must lead in this work of practicalizing the economic theories that are offered by those who are "set apart" from business. They must lead in the work of establishing in our everyday practices everything from among the theories of the economists that proves valuable to mankind. They must be able to show the unworthiness of everything impracticable in the teachings of the economists, ethicalists, educationalists and religionists.

16. *Divisions of Economics and their Applications.*—Ordinary economy means care in the individual's expenditure of his time, his talents and his treasure. Political economy, in general, means the best way that can be found for satisfying the needs of mankind.

Theoretical economics, the earlier style of political economy, overlooks the fact that, at least in some instances, the public must give to self-interest such direction as may be required to compel self-interest to serve the public need. Practical economics, the later style of political economy, hints at, teaches and proposes, that the public shall some day so shape and direct the conduct of every human endeavor as to compel self-interest to serve the common need.

In utility economics, in general, the public is now conducting an experiment. The public has undertaken to apply to certain of the many departments of human endeavor, the theories of the later or so-called practical economists. Applied economics is a matter of greater concern to the telephone utility than to others, because, no other business is so closely related, economically, to its patrons or to the public.

It is plain, therefore, that the telephone man must lead in the practical application of all that is economically beneficial to the public?

(To be Continued)

Dividends and Interest Payments of Telephone Companies.

In the United States Census report on telephones for 1912, some interesting figures are presented regarding dividends. The figures relate only to incorporated telephone systems reporting annual incomes of $5,000 or more.

It is obvious that in considering the relation between dividends and interest payments and capitalization, it is necessary to show the entire amount of capitalization in the hands of the public and the entire amount of dividends or interest paid thereon, regardless of the question whether such capitalization represents the telephone business only or includes investments in other industries, or whether the dividends or interest are derived wholly from income from the telephone business or include revenue from other sources.

The total amount of interest on founded and floating debt and mortgages was reported as one item for 1912. The interest on funded debt not being reported separately, the figures for total capitalization presented are those showing the gross capitalization, exclusive of inter-company holdings of the Bell system, but not exclusive of investments in outside business. The figures for total dividends similarly represent the gross payments, less duplications due to inter-company payments, but without any deductions of income derived from outside sources.

The accompanying table shows not only the totals, but also the different classes of securities and of dividend payments; but for reasons already mentioned it is impossible, in the case of the Independent companies, to exclude duplications due to inter-company holdings or payments from the figures for the several classes of securities and payments.

Class of Stock.	Total.	Bell Telephone System.	All Other Systems.
Common stock:			
Number of companies reporting	1,708	176	1,532
Dividend paying	808	71	737
Non-dividend paying	900	105	795
Amount outstanding	$541,681,477	$384,308,933	$157,372,544
Dividend paying	$426,453,971	$372,595,815	$53,858,156
Non-dividend paying	$115,227,506	$11,713,118	$103,514,388
Dividends:			
Amount	$32,255,125	$28,905,001	$3,350,124
Average rate per cent. on dividend-paying stock	7.56	7.76	6.22
Preferred stock:			
Number of companies reporting	231	37	194
Dividend paying	161	21	140
Non-dividend paying	70	16	54
Amount outstanding	$45,082,402	$13,576,500	$31,505,902
Dividend paying	$34,751,619	$13,440,150	$21,311,469
Non-dividend paying	$10,330,783	$136,350	$10,194,433
Dividends:			
Amount	$1,865,684	$804,840	$1,060,844
Average rate per cent. on dividend-paying stock	5.37	5.99	4.98

Statistics Regarding Dividends of Incorporated Companies.

A notable feature of the telephone industry is that a large number of the small companies pay no dividends and have no outstanding funded debt upon which interest is paid. In the table, companies paying dividends are distinguished from those which do not. In this table it is impossible to exclude duplications due to inter-company holdings in the case of Independent companies, but such duplications are excluded for the Bell companies. It will be understood that the statistics for companies yielding a return on capitalization covers the entire capital stock even though no dividends were paid.

In 1912 the total dividend payments of incorporated telephone companies on their common and preferred stock amounted to $34,120,809 and represented 5.9 per cent. on the net capitalization of these companies. The percentage for the Bell system was 7.5, and for all other systems 2.3. These average rates, based on the outstanding capitalization, are more or less misleading, however, as no dividends were paid on a large amount of both classes of stock. Of the 1,708 incorporated companies, only 808 paid dividends in 1912.

The average rate paid on common stock was 7.56 per cent. and on preferred stock 5.34 per cent. The Bell system paid a 7.76 per cent. dividend on 97 per cent. of its outstanding common stock and almost 6 per cent. on 99 per cent. of the outstanding preferred stock. Non-Bell systems paid 6.22 per cent. on 34 per cent. of the common stock, and a 4.98 per cent. dividend on 67 per cent. of the outstanding preferred.

Operators' School Held at La Crosse, Wis.

The telephone operators of the La Crosse (Wis.) Telephone Co., together with those of adjacent territory, were recently assembled at La Crosse for a practical school of instruction, conducted by W. S. Vivian, secretary of the Independent Telephone Association of America. The school had its headquarters at the Stoddard Hotel where switchboards were set up in the parlors and practical demonstrations, with instructions, were given in the proper manner of handling long distance calls, voice and courtesy as best suited to please telephone patrons, etc.

The operators were also entertained at a theater party, after which refreshments were served at the exchange of the La Crosse Telephone Co. The company provided the entertainment which was greatly appreciated by the operators.

New York Commission Issues Order in New York Case

Order Establishing New Telephone Rates for New York City, Effective July 1—Important Modifications Made to Schedule Submitted by Company—Order Acceptable to Joint Legislative Committee —Bill Introduced in Legislature to Strengthen Commission's Supervision

The New York Public Service Commission has issued on order in the New York City telephone rate case. The order will become effective July 1, and contains some important modifications of the schedule submitted by the New York Telephone Co. The public service commission's decision is acceptable to the joint legislative committee, which investigated the telephone rates independently of the commission, according to the committee's chairman, Senator James A. Foley. In the meantime Senator Foley and Assemblyman Donohue have introduced a bill to strengthen supervision over telephone companies in the state by the public service commission.

The most important adjustment ordered by the commission is that cutting apartment house equipment charges so as to make a general five-cent rate for local calls of tenants. Further reductions in toll charges for some outlying districts are also ordered, and the company must provide service in Manhattan and Brooklyn at the rate of $40 for 800 messages, instead of $42 for 840 messages, against the present rate of $48. In the opinion of Senator Foley the reductions ordered by the commission will amount to $3,000,000 in Greater New York. The legislative committee objected to the company's schedule, on the ground that it provided a reduction of not more than $2,300,000.

Schedule Provided in Commission Order.

The commission's order fixes maximum rates, leaving the company free to make reductions during the period covered by the order. It provides that the maximum rates to be in force July 1 shall be those submitted by the company in its new schedule, but with several modifications. It is provided that the message rates of the company shall be established as for ten zones, in accordance with the zone map filed with the commission by the company. The local areas for service, under message contract rates, are changed from those fixed by the company, so that zones 6 and 7 are not only local to each other, but local also with zones 4 and 5. This permits Queens subscribers to talk with all Brooklyn, including the Coney Island section, and also with Long Island City and Astoria, under their message contracts. The minimum message direct line rate of $36 for 720 messages is retained.

The upper Bronx region, zone 3, is made local, not only with zone 2, but also with zone 1, so that all Manhattan and the Bronx will constitute a single local area for zone 3, without toll charge. The minimum message, direct line rate of $36 for 720 messages, is retained for zone 3. The Far Rockaway and Hammels exchange area, zone 8, which the company proposed to make local only with zone 7, the Richmond Hill and Jamaica district, is also made local with zone 5, the Coney Island and Bath Beach section. From zone 8 to zone 1 (Manhattan) the proposed toll rate is reduced from ten cents to five cents, the same as the company's proposed toll charge from zone 8 to zone 4, the Brooklyn and Long Island City district.

The minimum message rate for individual direct lines in zones 1, 2, 4 and 5, for both business and residence service, is reduced from the proposed rate of $42 for 840 messages, to $40 for 800. Private branch exchange rates in zones 1, 2, 4, and 5, for the minimum equipment and messages described by the company in its schedule of proposed rates, are reduced by the commission from $132 to $126 for monitor board service, and from $138 to $132 for corded switchboard service. These are the same as the rates stated by the company for zones 3, 6, 7 and 8, which are not changed. The company's charges for minimum private branch exchange equipment and messages in zones 9 and 10 are required to be kept upon the present schedule rates, as discounted, and to that extent are made lower than those proposed by the company. The private branch exchange rates so fixed as a maximum in the various zones, are not to apply to hotels, which the company will serve under special contracts, as heretofore.

Extension stations are at the rates fixed by the company in its proposed schedule. All rates now in force within zones 9 and 10, for individual message rate subscribers, are kept as they are at present; that is to say, the discounted rates now in force. All flat rates and flat rate service within the city of New York are to be preserved.

To Widen Scope of Commission.

The joint bill introduced in the legislature at Albany by Senator Foley and Assemblyman Donohue transfers the jurisdiction over local rates and the service in New York City and Long Island City to the public service commission of the first district. All telephone companies of the state are made subject to regulation, thereby adding almost 1,000 lines which are now exempt from supervision. The companies are classed as commercial and mutual, and separate standards are provided. Universal service throughout the state is provided for by giving power to the commission to compel commercial companies to connect and furnish joint communication, the rates to be fixed by the commissions.

The measure further provides that every company is required to obtain a certificate of public convenience and necessity before building or extending its lines. The commissions would have the same control over the issue of stocks, bond transfers, and sale of property of telephone companies as they now have over railroads. Holding companies like the American Telephone & Telegraph Co., are subject to complete control and regulation.

Senator Foley, after examining the commission's rate order, said that he was satisfied that it would bring about a total reduction in Greater New York of fully $3,000,000. "We considered the schedule submitted by the telephone company a reduction of but $2,300,000," he said, "as we thought that some of the cuts made related to business outside the city limits, and should not, therefore, be considered in connection with the total reduction we felt should be given in New York City.

"I think further reductions of at least $700,000 will be involved in the decision of the public service commission, and I feel that it is a great victory. While it does not provide as much as the schedule prepared by Professor Bemis for our committee, it meets so many of the demands that we can accept it as the best available under the circumstances. If the telephone company does not accept the decision, and it is necessary to strengthen the order by legislative action, I think this schedule could be embodied in the bills already introduced, and would receive unanimous support."

There are several telephone bills pending in the state legislature. The amendments to the Lockwood-Goldberg

bill for reduced rates in New York City, in accordance with the schedule filed by Professor Bemis, are being withheld pending the announcement of the company's stand on the commission's rate order.

The Foley-Donohue bill proposes amending the public service commission law (subdivision 17 of section 2, and new subdivisions 17-a of section 92; subdivision 1 of section 95, subdivision 3 of section 97, and sections 98, 99 and 102), by providing that the term "telephone corporation" shall include every holding corporation or holding company. The term "commercial telephone corporation" shall include every telephone corporation which does business for profit. The term "mutual telephone corporation" shall include telephone corporations which do not conduct business for profit. Every telephone corporation shall be deemed a "commercial telephone corporation" unless there shall be filed with the public service commission of the first district a certificate, sworn to by the president or a majority of the owners of such corporation, that it is not operated for profit, but solely for the convenience of its subscribers.

The jurisdiction of the first district commission is extended to telephone lines and properties in the counties of New York, Bronx, Kings, Queens, Richmond, Nassau and Suffolk. Whenever there shall be filed with the commission any schedule stating an increased rate for any telegraph or telephone corporation, the commission shall have authority, either upon complaint or upon its own initiative without complaint, at once, and without answer or other formal pleading, but upon reasonable notice, to enter upon a hearing concerning the propriety of such increased rate, and may suspend the operation of the increased rate for not longer than 120 days beyond the time when the rate would otherwise go into effect.

A further suspension of the proposed rate for a period of six months may be made where the hearing cannot be concluded within the original period of suspension. The commission shall have power to fix suitable and convenient standard commercial units of service for telegraph and telephone corporations; to fix adequate standards of design of installation, construction, maintenance, relocations, extensions and operation of telephone and telegraph lines; and to prescribe reasonable regulations for testing such service. Penalty is provided for non-compliance with the orders of the commission of $500 for each offense, and the further sum of $25 for each day of continuance of such offense. An action to recover penalty or forfeiture may be brought at any time, instead of only within one year after the cause of actions accrue, as at present.

The bill has been referred to the public service committee.

Unreasonableness of Toll Charges in Kentucky.

The Glasgow (Ky.) Home Telephone Co. has filed an amendment to its petition before the Kentucky Railroad Commission against the Gainesboro Telephone Co., and G. T. Tucker, owner of the telephone system which serves Cave City, Ky. The Glasgow company complains that Mr. Tucker is furnishing free service to the Gainesboro subscribers, but that he exacts tolls of its subscribers.

The alleged discrimination was held recently to be beyond the jurisdiction of the commission and the amendment was filed so that the commission might consider the complaint on the grounds that the tolls charged by Mr. Tucker are not reasonable.

Court Rules Against Needless Mutilation of Shade Trees.

A decision was recently handed down by the Michigan supreme court in a case brought by William F. Bolender against the Southern Michigan Telephone Co., of Burr Oak. In this case the plaintiff alleged that the defendant has cut off the tops of a number of the fine maple trees which extended along the highway bordering his property. The supreme court upheld the judgment of the lower court that telephone and telegraph companies are liable for damages for the needless and unnecessary mutilation of shade trees by linemen erecting pole lines through the county.

The question of whether the property owner owned the trees in the highway was brought up and the defendants took the position that he did not own the trees. The higher court, however, holds that a man's property extends to the middle of the road.

Dallas Automatic Company Seeks Increase of Capital.

A petition asking that the Dallas Automatic Telephone Co., of Dallas, Texas, be permitted under provisions of its charter, to increase its capital stock $500,000 was filed recently with the board of city commissioners by President J. C. Casler, of that company. The petition was referred to Finance Commissioner W. T. Henderson.

The proceeds of the proposed stock sale, the petition says, are to be used wholly in extension of the company's telephone exchange and its service lines.

Cincinnati & Suburban Bell Company's Annual Report.

The gross earnings of the Cincinnati & Suburban Bell Telephone Co. of Cincinnati, Ohio, for the year ending December 31, 1914, as shown in the annual report to the stockholders, were $2,726,742, an increase of $148,184 over the preceding year. Deducting the expenses which were $1,827,448, left a net income of $899,294, an increase of $18,549 over the year 1913. Dividends to the amount of $796,477 were paid during the year, leaving a surplus of $102,817, representing an increase of $28,012 over the surplus at the end of the preceding year. On December 31, 1915, the company had 3,924 more subscribers than at the end of the previous year.

Receiver of Interstate Company, of N. J., Files Report.

James Kearney, of Trenton, receiver for the Interstate Telephone Co., of that city, has filed his second report for the period from December 1, 1914, to February 28, 1915. The gross income was $79,590, and the disbursements $38,923, leaving a profit of $40,667. The balance on hand on December 1, last, was $32,698. Experts employed by the receiver made an appraisal of the properties of the company and its subsidiaries, and valued them at $1,517,449, less depreciation of $334,978, or an apparent value of $1,182,471.

Earnings of Northwestern (Bell) Company.

A substantial increase in business is shown in the annual report of the Northwestern Telephone Exchange Co., of Minneapolis, Minn., for the year ending December 31, 1914. The total operating revenue, $4,565,822, represents an increase of $494,233 over the preceding year. The operating expenses were $3,616,272 and the net earnings $1,040,014, an increase of $90,154 over the year 1913.

Financial Report of Central District Telephone Co.

The Central District Telephone Co., of Pittsburgh, Pa., reports gross earnings of $6,617,694 for the year ending December 31, 1914. The expenses were $5,075,591, leaving $1,542,103 net earnings. Deducting $482,812 for interest and $1,050,000, paid out in dividends, leaves a surplus of $9,291.

Canadian Municipal System Shows Deficit.

The annual report of the telephone department of Edmonton, Alta., Canada, which is municipally owned, shows a deficit of $38,277 for the year 1914. This brings the total net deficit against the telephone department up to $107,573.

Massachusetts Commission Recommends Telephone Probe

Appropriation Asked of Legislature to Cover Cost of Exhaustive Investigation of the Relations of the New England Company to the A. T. & T. and Western Elecric Companies, the 4 1-2 per cent. Charge of the A. T. & T. Co. and all Matters Affecting Rates

The Massachusetts Public Service Commission, as reported in last week's issue of TELEPHONY, has issued an extended report to the legislature asking for an appropriation to cover the cost of an exhaustive investigation into the conditions of telephone service and rates within the state. The report was the result of an order by the house in February requesting the board to investigate the relations between the New England Telephone & Telegraph Co. and the American Telephone & Telegraph Co.. to ascertain the basis of existing rates; the status of the 4½ per cent. charge made by the American company for the use of instruments, etc.; the relation of exchange and toll revenue to existing rates; the apportionment of investment; and, in general, all pertinent matters affecting the present charges of the New England company.

The commission points out that the investigation suggested would require more funds than are at the board's disposal, those available taking care merely of the routine expenses of the telephone and telegraph department. So far as information could be furnished the house without extensive investigation, however, the commission has undertaken to meet the requirements. An abstract of the report follows.

The American Telephone & Telegraph Co. owns 58 per cent. of the stock of the New England Telephone & Telegraph Co., the latter having a total par value of $43,247,900. Since 1912 the New England company has paid 7 per cent. dividends, and in the year 1914, the American company received an income of $1,762,432 from its investment in this subsidiary company. The two companies jointly own and use some pole lines, and handle jointly such long distance business as requires the use of the lines of both companies. The American company leases from the New England company various loops, circuits, space on poles and in underground conduits, floor and building space for the use of terminals, offices, rest rooms and storage. It employs the New England company to do certain testing, operating and inspecting; buys from the New England company power and electric current for the long distance lines; and pays the latter commissions on business originating over the latter's lines.

The New England Telephone & Telegraph Co. leases from the American Telephone & Telegraph Co. some pole space and some circuits. It also leases from the American company all its telephone instruments; secures from it the service and assistance of its general staff, and the free use of all inventions and improvements in the art of telephony developed or acquired by the American company.

The most important contract is one under which the Bell furnishes instruments, expert services and invention rights. Formerly there was a royalty charged on the instrument basis, but since 1902 the Bell company has collected 4½ per cent. of the gross revenue from telephone operation for these services. In 1914 this amounted to $1.586 per instrument. The total payment was $828,867.20, while the number of instruments furnished was 522,458.

THE 4½ PER CENT. CHARGE.

The Massachusetts commission has made no investigation to determine whether these relations are fair, reasonable and proper. It feels, however, that they deserve consideration. To emphasize their complication and importance, the commission quotes from recent findings of the public service commissions in Vermont, California and Georgia, all of which criticize the 4½ per cent. charge as unduly high, and which set forth at length the reasons why this conclusion is reached. The Massachusetts board says:

We submit these extracts from the reports of public bodies in other states so that the house may appreciate the variety of questions raised by this 4½ per cent. payment and the amount of investigation necessary before a final judgment on this and kindred contracts may safely be reached. It will be noted that the Vermont commission arrived at the conclusion that a yearly rental of $0.62 per instrument should be substituted for the 4½ per cent. payment which now amounts in the case of the New England company to $1.586 per instrument. The California commission, in the San Jose case, decided that the payment ought to be 2½ per cent. instead of 4½ per cent. in the territory under consideration. But it left the question open for future consideration as far as the whole state is concerned. Recently the New York Public Service Commission of the second district has announced its conclusion that $1 per instrument is a fair rental in that state, where the 4½ per cent. payment now amounts to about $2 per instrument. The Wisconsin Railroad Commission and the New York legislative committee, which are conducting telephone investigations, have not yet made their reports. . . In the Vermont case, it should be said, the company has not accepted the decision of the commission with respect to its rates which were ordered reduced, and has carried the case to the courts.

RELATIONS WITH WESTERN ELECTRIC.

The report describes at length the relations between the New England and Western Electric companies, reprinting the contract under which the two companies work. Summing this contract up, the Western Electric Co. becomes thereby the exclusive purchasing agent of the New England company. Practically all the material and supplies which the latter uses must, under the terms of this agreement, be bought from the former, which receives, for this service, compensation on a varying percentage basis. The reasons of the New England company for entering into this contract are given as follows:

The Western Electric Co. is the manufacturing department of the general Bell system. Up to 1902, it did no purchasing for any of the Bell companies, each company operating its own purchasing department. Several difficulties in this system were manifest. None of the telephone companies could be classed as a jobber, and often they were not able to get the most favorable prices. It was often impossible to obtain material needed in the quality and in the quantities needed. This increased the amount of supplies to be kept on hand to meet emergency demands. About 1902 it was arranged by the Philadephia Bell company to have the Western Electric Co. act as its purchasing agent, and the scheme was so successful that it has since spread throughout the country.

An investigation by the New England company showed the arrangement effected a saving of about $50,000 per year on the New England system alone, without taking into account any savings by reason of being able to procure lower prices, which have in fact been obtained. Briefly, the benefits claimed by this contract are:

1. Savings by reason of the ability of the Bell companies to secure lower prices for supplies by combining their purchases in a way to secure the concessions obtainable by heavy purchasing power.
2. Savings in carrying charges resulting from smaller supplies of stock in company warehouses, made possible by central sources of supply from which heavy and immediate shipments can be made to any part of the country.
3. Savings in the cost of purchasing departments resulting from the concentration of all purchases of all the companies into a central purchasing department.
4. Savings in freight charges.
5. Savings in inspection of material.
6. Prompt deliveries.

7. Deliveries in needed quantities.

The Vermont commission in commenting upon these relations said that in its opinion the addition of 10 per cent. to the cost of material made by the telephone company's engineer in the inventory submitted in the case (in re Addison & Canton, et al, filed March 14, 1914) is unwarranted. The board said: "We think that the percentages paid to the Western Electric Co. for acting as purchasing agent could be saved if the New England company made these purchases itself, and that these percentages, if so utilized, would be ample to cover any additional charges of material. The commission has therefore unloaded the 10 per cent. charge upon material."

In the Georgia case cited (City of Columbus et al vs. Southern Bell Telephone Co. decided Sept. 8, 1914), the commission said: "This contract (Western Electric and Southern Bell) is objectionable on the same principles as that with the American Telephone & Telegraph Co., although we are inclined to think not so objectionable as to actual results."

Prior to the dissolution of the Western Union-Bell combination, if its office at any point was temporarily closed, the Western Union company delivered telegrams destined to the territory of such office, over the lines of the New England company and absorbed the consequent telephone charge, the service being given to it at reduced rates. Outgoing telegrams from the territory tributary to such a closed office were delivered by the New England company to the nearest Western Union office that was open, the latter company absorbing telephone charges in such cases also. Since the dissolution, the Western Union company of its own volition has practically ceased to handle business under this arrangement. This situation has been the subject of inquiry by the Massachusetts commission but no definite action has yet been taken.

New England Company's Finances.

The gross revenue of the New England company for 1914 was $18,721,750, of which exchange service was responsible for $13,923,493 or 74.5 per cent., toll service revenue, $4,223,591.34; and miscellaneous items made up the rest. No attempt is made by the company to apportion the expenses between exchange and toll service. The telephone plant and property of the company on December 31, 1914, were totalled at $74,232,427, of which exchange plant represented $29,876,741; toll plant, $13,899,831; unclassified plant common to both services, $22,444,446; general equipment, $1,034,905; materials and supplies, $228,432; working capital, $2,141,879; and securities, $4,606,190.

So far as the commission can determine, the New England company has made no attempt to apportion revenues, expenses and investment between exchange and toll service, nor has any attempt been made to fix rates in accordance with theoretical costs. So far as the company has had any part in making existing rates, the entire investment, all revenues and all expenses have been considered, on the basis that the rate schedules as a whole should produce sufficient revenue to pay fair wages and to secure comprehensive, adequate and suitable service, proper provision for replacements of plant, and a reasonable return on the investment, and that the rates for different classes of service should be such as will most equitably apportion among the various users, the cost of the service as a whole.

Rate Investigation.

The commission is unable to discover from an inspection of the reports and decisions of public supervising bodies in Massachusetts or elsewhere, that either the companies or these bodies, in fixing rates, have followed any clearly defined principle in apportioning among users of various kinds of service, the cost of the service as a whole. Whether this is feasible cannot be determined without extended investigation. So far as the existing rates of the New England company are concerned, it appears to be true that they have largely been fixed under the supervision or influence of the public authorities. It does not appear that the American company has undertaken to fix the rates of the New England company, which have been extensively adjusted by the Massachusetts commissions in jurisdictions since 1910.

In conclusion the report says: "As we have already indicated, our report upon the foregoing order is necessarily confined to the information now available. In the judgment of the commission, a thorough investigation, involving not only a consideration of the matters presented in the pending order, but a study of the whole situation with respect to telephone service and rates within the commonwealth, is desirable in the public interest. It would seem that telephone patrons in this commonwealth are entitled to some adjudication in regard to the propriety of the rates which they are now paying for telephone service, especially as similar investigations are now pending in other states. The authority of the commission for conducting such an investigation and making such an adjudication is ample under existing law, but this authority can be made effective only by a legislative grant of the necessary appropriation. The report is signed by the full board.

The Bell Telephone System in Washington, D. C.

How It Contracts for Telephone Service—Suggestions as to What Can be Done to Reduce Its Monopoly of This Business and Permit the Independent Telephone Concerns to Get a Fair Chance at Bidding on It

By A. P. Connor

The Bell telephone system has not the reputation of permitting an Independent telephone concern getting anything that it could prevent. A lot of this prevention has been developed on what might be termed "pure unadulterated bluff," and the Independents have not awakened to the fact that they are in a position to prevent it.

In the District of Columbia, the telephone company has been doing about as it pleased, and the Public Utilities Commission has in every case that the writer knows of, favored the company. This may be due to the fact that the commissioners of the District of Columbia, who also comprise the board of Public Utilities Commission, have not the time nor the technical ability to give the matter very much consideration. The telephone company also employs an ex-commissioner of the district as its counsel.

Unfortunately the District of Columbia has no voting power and its voice in its matters is very much drowned out by the exigencies of the political necessities of the party in power. It is a city approaching half a million. Although the Public Utilities Commission has the power—because the commissioners have said so before Congressional committees—to order it, the city has no adequate arrangements of transfers for the street cars. As two car lines have control of the situation, the ridiculousness of the situation can be realized.

Occasionally a protest comes up about the telephone service, but in the same way, it always seems to get strangled.

The government use of the telephones is entirely independent of the "District of Columbia." Once a year it asks for bids for telephone service, and this request is made up in a way that has apparently been built on the arrangements that the

Bell telephone system uses, wherever it can. It is certainly a work of art in the way it seeks to prevent outsiders coming in and the prices are, to every appearance, exorbitant. The prices quoted by the telephone company for the fiscal year ending in July, are included in this article for the inspection of the readers, and such action as they may deem desirable to promote their interests.

It is well known that the Bell system is combined and intertangled with the Western Electric Co. in a way which has, in the past, done great harm to the Independent telephone industry. There does not appear to be any legal standing to support this action if the Independent telephone manufacturers would oppose it. This arrangement should be divorced, even as its connections with the Western Union Telegraph Co. were. The ways to bring about these results are: The courts; through legislation; through the Department of Justice; through the Interstate Commerce Commission; and by bringing the matter to the attention of Congress for investigation. Congressmen will take an interest in the matter, if it is put to them in the proper way by their constituents.

In the matter of the bids on the telephone contracts for the year 1915-1916 for the government, that were asked for March 10, objections can be raised by the telephone interests. They can be directed to the Secretary of the Treasury for investigation, so that the contracts will not be let on the existing proposed arrangements, which are discriminatory against all not connected with the Chesapeake & Potomac Telephone Co., the part of the Bell system that is in Washington. This will bring the matter up and some good ought to result.

The parts of the contract to which attention may be directed, are as follows:

That bids should be provided for apparatus which can be

Contract for telephone service for all departments and independent establishments of the Government within the District of Columbia to be furnished by the Chesapeake & Potomac Telephone Co., of the State of New York.

NATURE OF SERVICE.	Cost.
(1) That said company will install, equip, and maintain such telephone equipment as may be required in the District of Columbia, and furnish service in connection therewith, at the following rates during the fiscal year 1915:	
(*a*) Common battery private branch exchange switchboard (including 1 operating set of telephones for each operator's position), each, per annum	$24.00
(*b*) Trunk lines connecting a private branch exchange switchboard with the company's exchange system in the District of Columbia (minimum trunk equipment of a private branch exchange, 2), each, per annum	24.00
(*c*) Telephone stations, including interior wiring for use in connection with private branch exchange switchboards, each, per annum	6.00
(*d*) Circuits for use as extension lines, to connect telephone stations located outside the building in which the private branch exchange switchboard is located with said switchboard, or for use as tie lines, connecting two or more switchboards furnished to the United States Government by the company, or for use as private lines, independent, not connected with any exchange, the distance to be measured along the nearest street route, for each one-eighth mile or fraction thereof, per annum	4.50
(*e*) Outgoing completed local messages of 5 minutes or less in duration sent over the trunk lines connecting the private branch exchange switchboard with the company's public exchange, each	.02
The number of messages to be paid for shall be ascertained from the record made by the company's automatic registering devices, provided such record agrees within reasonable limits with the record kept by the departments. In case of unreasonable discrepancies between the two records adjustment of the account shall be made by the Secretary of the department concerned.	
(*f*) Direct lines, each with one main station, connected with the company's exchange system and including the right to send in each year 600 local messages, each of 5 minutes or less in duration, to any other telephone station connected with the company's exchange system in the District of Columbia, for each such direct line, per annum	39.00
First 600 additional local messages, each	.045
Next 1,200 additional local messages, each	.03
Beyond a total of 2,400 local messages, each	.02
Adjustment of account for local messages to be made at the end of the fiscal year.	
(*g*) Extension stations connected with private branch exchange stations, or with exchange lines, each, per annum	6.00
(*h*) Additional operator sets consisting of a chest transmitter and head receiver for use at private branch exchanges, each, per annum	2.40
(*i*) Additional watchcase or head receivers, each, per annum	1.20
(*j*) 6-inch extension gongs, equipped with annunciator drops for continuous ringing, each, per annum	4.80
(*k*) Extension bells, each, per annum	1.80
(*l*) Telephone booths, each, per annum	12.00
(*m*) All messages to points outside the District of Columbia originating at the stations connected with the Government switchboards, or at the direct-line stations, will be charged for at the company's regularly established rates.	
(*n*) Extension or swinging arms for use in connection with desk sets or portable instruments, each, per annum	2.40
(*o*) Lead-covered cable in connection with No. 2 private branch exchange, not located on the same premises with the receiving station, each 100 feet or fraction, route measurement, per annum	3.00
Minimum charge for lead-covered cable, per annum	12.00
(*p*) Circuits consisting of 3 wires, each connecting No. 2 private branch stations, not located on the same premises with the receiving station, each 100 feet or fraction, route measurement, per annum	1.00
Minimum charge for such circuits, per annum	6.00
(2) The company will install, equip, maintain, and keep in repair all connecting circuits specified for interdepartmental service, to be used exclusively by the Government, at the rate of $4.50 per annum, per one-eighth mile, or fraction thereof, the distance to be measured along the nearest street route. The company will set aside a portion of its multiple switchboard equipment at its main exchange for such interdepartmental lines. Efficient operators will be employed by the company for these lines and first-class service will be furnished at all hours of the day and night. The company will make no charge for the interdepartmental switchboard nor its operation.	
(3) Each department, or other establishment of the Government, party to the interdepartmental switchboard, shall pay for its own mileage for the circuits connecting with the interdepartmental switchboard and shall also pay its proportionate share of the cost of 8 circuits connecting said switchboard with the Capitol Building. All circuits connecting the interdepartmental switchboard with the Capitol Building are to be used only for outgoing messages to the Capitol.	
(4) The cost of maintaining the tie lines at the White House at the circuit rate herein stated is to be shared equally by the White House and the various departments and Government establishments connected by the same.	
(5) The telephone stations, except those of a No. 2 private branch exchange system, connected with private branch exchange switchboards, provided for herein, will be moved by the company when directed, without charge, from one position to another in the same building in which they are located. At the request of the department the company will change the location of switchboards or telephone stations of a No. 2 private branch exchange system, charging the department therefor the cost of material, labor, transportation of employees, and supervision. Any changes in the location of switchboards which the company may make for its own convenience, or in the renewal of equipment, will be done without cost to the department.	
(6) All payments are to be made at the end of each month during the period hereinbefore specified.	
(7) The Secretary of the Treasury, by accepting rates and terms herein stated on behalf of the Government, agrees that the equipment now in service is covered by this contract.	
(8) Should additional service or equipment be required by any of the departments or establishments of the Government, such additional service or equipment will be furnished at the rates named herein. Should any of the departments or other establishments of the Government discontinue the use of any equipment or service, a like reduction will be made from the date such equipment is discontinued, provided the company is given not less than 10 days' notice of the purpose to discontinue.	

Approved:
JUNE 22, 1914.

W. G. McADOO,
Secretary of the Treasury.

Contract for Fiscal Year 1915 for Class 20 Telephone Service to Be Supplied by the Chesapeake & Potomac Telephone Co.

bought, installed and operated independently of the telephone company or in indirect or direct connection with it;

That the telephone company shall only provide "service" to the various governmental buildings;

That all apparatus used by the government shall be bid for independently of the service, and service wires run by the telephone company;

That the maintenance and repair of such apparatus shall be bid for independently or in connection with the supplying of the apparatus, as may be arranged; and

That unit bids be supplied on all work necessary in connection with the installation of telephone wires other than that required for the incoming service.

Such other items as may be deemed desirable could be included in the objections.

This will tend to eliminate the "by the year arrangement" by which the Bell system obtains more in annual rental for its apparatus than the apparatus would cost at retail. This will open up a great field for contracts for the whole telephone industry and the government will greatly benefit by it.

It should be noted in the contract arranged with the government by the telephone company, how it keeps all the old apparatus on the government, and how it works the other details which produce a tremendous income. It is to be noted that the telephone company evidently gets paid for the messages, independent of the installation or rental of the instruments. There is nothing to prevent a private company coming in and getting a lot of the departmental business, if it works out the problem properly and looks over the ground carefully.

But supposing the telephone company refuses, as it will, to connect to strange apparatus?

Why just let it try it. There are a number of remedies that will make it do its legal duty. The writer is aware of thousands of locations where the Bell system connects to telephone apparatus which it did not make, does not own and does not operate; in his opinion it dares not object to connecting. If the telephone companies that are independent of the Bell system are afraid to obtain their legal rights by insisting on them, they may be sure that the Bell system will not seriously endeavor to induce them to, or to relieve the present situation of quasi-monopoly.

In the matter of governmental contracts every one has a right to fair and impartial treatment. It is further the right of the public, or individual, to protest against any contracts which are against the interest of the public or which are such as to encourage waste of public money or the taking of material under arrangements that are not above suspicion.

The accompanying list indicates the contracts awarded to the Chesapeake & Potomac Telephone Co. on behalf of the government, in Washington, D. C. Attention is called to the apparatus rented at so much per annum. In most cases this appears to be suitable for open bidding. The apparatus should also be made to meet a specification which it, at the present time, does not do.

Local Telephone Operating Rules and How Developed

A Serial Story Dealing with Local Operating Terms and Rules—Reasons for Their Use—A Real Study of Rules Beginning with Fundamentals and Developing Essential Factors in Operating Room Practice, for Small and Large Exchanges—Conclusion

By Paul Hamilton

At Princeville, where the first meeting was held, Mr. Carney called the session to order, and Mr. Prince at once advanced the proposition as to whether the meetings should continue. He said that under present conditions his own exchange required more time than he could find in 24 hours.

Mr. Burke agreed with Mr. Prince, adding to his reasons one to the effect that of the nine exchanges represented there were but three operating the same type of board. To undertake to formulate rules applicable to all would be an undertaking in which all would not be interested. He proposed that, as they had covered the general instruction ground, those using boards of the same type take up the work of forming rules adaptable for their particular use. He then presented five copies of the previous rules adopted to each of the managers.

"Used a neighbor's multigraph," he explained.

"You were fortunate. That would have meant a great amount of work with a typewriter," remarked Mr. Carney.

Upon the request of several of those present Mr. Burke consented to read his synopsis of the rules:

Operator's Duty.—It is the principal duty of an operator to respond, promptly and courteously, to the signals upon the switchboard, following the routine method hereinafter outlined. She will report promptly any condition that at any time may interfere with the performance of her duty, as above outlined, to her superior.

Operator's Responsibility.—Although the management is responsible to the public for the service rendered, certain direct dealings with its patrons must be entrusted to the operators. For their guidance, definite rules have been laid down which should govern their dealings with the patrons. Their responsibility to the management rests in the rigid application of these rules in the performance of their duties. While certain responsibilities of the management are necessarily delegated to the operator, she is cautioned that in no instance must she engage in an argument or altercation with a patron. If a patron imposes the use of offensive language upon her, she will report the matter promptly to her superior. The necessity for a prompt and accurate report of such irregularities is imperative, in order that the management may take the necessary action in her behalf.

Manner of Speaking.—In conversation with subscribers the operator will cultivate a firm, courteous, business-like manner of speaking, carefully avoiding that which might be considered as inattention or indifference.

Divulging Information.—The operator is not only cautioned but warned against divulging any information that may come to her through the medium of the exchange. This applies to her conduct at all times, whether on duty or not. In compliance with this rule, she should refrain from passing judgment upon the importance or unimportance of the information.

Attendance.—The requirements of the business necessitate regular attendance and punctuality on the part of all operators. In the determination of their rank in efficiency as operators, attendance and punctuality are given special consideration, and upon efficiency her opportunity for advancement depends.

Premeditated Absence.—The operator should not assume the responsibility of anticipated absence, whether temporary or extended, without first securing permission from her superior. Such permission should be requested sufficiently in advance of the intended leave, to allow for the necessary arrangements for filling her place to be made.

Unavoidable Absence.—In cases of unexpected and unavoidable absence the operator should notify her superior

at the earliest possible moment, giving information as to the cause and duration of the leave necessitated.

Contagious Diseases.—Operators are cautioned against becoming exposed to contagious diseases of any nature, but if it is found that unavoidable exposure has resulted in the general exposure of the operating force, all must conform to any special rules or requirements decided upon as advisable by the management.

Operators having knowledge of having been exposed to contagious diseases will not be permitted to report for duty until satisfactory assurance can be given that there is no danger of spreading the disease.

Operators residing in districts under quarantine will not be permitted to continue on duty until they have complied with the requirements of the proper authorities, and removed beyond the limits of the district. The management will not become a party to any attempt to evade lawful quarantine regulations.

Manner of Dress.—While it is not the intention of the management to insist upon uniformity in the manner of dress, it is desirous that operators should avoid any ostentatious display, and confine their tastes to modest, comfortable styles of neutral or sober shades, preferably dark. Adherence to this suggestion will be found to work for their comfort and economy.

Deportment.—Unladylike deportment while on duty will affect her standing as an operator, and opportunities for advancement adversely.

Unwarranted criticism of the service may result from unladylike conduct of an operator while not on duty.

Personal Valuables.—Operators on duty are cautioned relative to the care and disposal of valuable belongings. Owing to the fact that the information relative to lost articles is often indefinite and circumstantial, the integrity of an associate may be unjustly questioned.

The management cannot assume any responsibility for the safe-keeping of such valuable property, and can only exert the ordinary means at its command in the investigation of reports of such losses. Due consideration in this regard, on the part of the operators, will serve to prevent personal losses and disagreeable misunderstandings.

Use of Exchange Premises.—The exchange premises are not to be considered at the disposal of the operators for social or business engagements, except in connection with the conduct of the affairs of the exchange. Friends and acquaintances should not be invited to visit the operating room without the consent of the manager or chief operator first being secured.

Patrons requesting permission to visit the exchange will be referred to the manager or chief operator.

Not Mail Address.—Operators will not consider the exchange as their mail address. Letters received at the exchange will be forwarded to her home address.

Gifts and Special Service.—Operators will refrain from accepting gifts or favors from patrons of the exchange which will place them under obligations as representatives of the company. They will not render any special service to patrons without the consent and direction of the management.

"To fill out our session here there is one other topic common to all," continued Mr. Burke, after concluding the reading of his report, "and that is that there are certain things an operator must not do."

"We ought to find quite a list along that line," commented Miss Sible. "Here is one!"

"Wait a minute," interrupted Mr. Carney. "Let's have a heading."

"'Operators will refrain from the following,'" suggested Mr. Burke.

After some discussion the following list was formulated:

Taking up a call before previous call is completed or disconnect signals having not received attention.

Accepting order without repeating it to calling subscriber.

Handling cords by other parts than the fiber shell.

Taking call in adjoining position when own position shows call or disconnect signal.

Not answering calls in order in which they come in, as far as possible.

Completing connections in the answering jacks.

Leaving position without permission.

Delaying calls to look at clock.

Chewing gum or eating while on duty.

Overstaying relief period.

Speaking in loud tones, disturbing other operators.

Using other than phrases set forth in the rules.

Asking information of operators on either side while on duty.

Handling subscribers' complaints personally.

Giving other than complete information in connection trouble and other reports.

Giving information other than the rules provide relative to lines out of service for non-payment, or any other special reason.

Giving name to subscribers, or names of other operators.

Holding conversation over subscribers' lines with friends or acquaintances.

Looking about room in neglect of position.

Neglecting to give careful and accurate attention to "peg-count."

Neglecting to make proper report of trouble on lines and equipment.

Playing with switchboard cords or instruments by swinging and bending them.

Neglecting to handle cords as noiselessly as possible.

Inserting pencils in jacks or restoring drops with pencil.

Ringing more than twice on a line without ascertaining if plug is fully inserted in line jack.

Keeping nail files, combs or other articles not necessary to her work on the switchboard.

At the close of the session Mr. Carney thanked them all for their interest and helpful suggestions in discussing the general aspect of their operating systems.

All were agreed that helpful ideas had been brought forth, and favored a continuation of their conferences whenever anything of general interest came up for consideration. Meanwhile each group having boards alike or similar in operation felt the advantage of meeting and formulating rules applicable in each case.

(*Conclusion.*)

Franchise Offered by Spokane City Council Refused.

The Pacific Telephone & Telegraph Co. has turned down the new franchise ordinance offered to it several weeks ago by the Spokane, Wash., city council.

The ordinance submitted to the telephone company by the city council provides for a 50 cent reduction in monthly rates, and a ten-year franchise, with the right reserved to the city to purchase the plant at any time during the life of the grant.

In his letter to the city council President E. G. McFarland, of the Pacific company, states:

"The conditions imposed on us by the franchise passed by the council last August and defeated at the November election, were more onerous than any we have attempted to operate under anywhere. The franchise now submitted is still more drastic than the one defeated at the polls, in that its term is shorter and the rates fixed by it, lower."

New England Telephone & Telegraph Earnings.

The annual report of the New England Telephone & Telegraph Co., of Boston, Mass., for the year 1914, shows a balance of $125,067 after the payment of dividends. This compares with $152,000 in 1913, $312,000 in 1912, $357,000 in 1911 and $910,000 in 1910.

Physical Connection of Telephone Lines and the Law

Similarity of Telephone Problems to Railroads — Wisconsin Anti-Duplication and Indeterminate Franchise Laws—Public's Right to Regulate Utilities—A Paper Read at the Second Annual Convention of the Independent Telephone Association of America

By Frank Winter

With the increased complexity of modern life, have come new and serious problems. One of these problems, and by no means the smallest and easiest solved, is the problem of the orderly development and growth of public utilities, and their relation to the public they are created to serve.

The three most important classes of public utilities are railway and transportation; heat, light and power; and telephone and telegraph.

Railways were first built to serve comparatively small communities or localities. Many single railways served each its isolated area. It was soon seen that this arrangement was not satisfactory. Separate lines first made connections, then joined or consolidated, creating railway systems.

This is spoken of because there is a remarkable parallelism between the development of the telephone companies and the railway companies. None of the laws governing the development and controlling the development of the railroad companies is fixed. In principle, the laws should be the same; in principle, the problems are the same; and in principle, the same class of laws can be passed, controlling and regulating the telephone systems. You know, of course, how the telephone system grew up, how each individual center at the expiration of the Bell patents had its Independent company generally; how these Independent companies connected themselves with each other into little systems and larger systems into still larger systems. Now the problem is how to co-ordinate these systems into an intelligent whole.

It is perfectly clear, it seems to me, that vocal messages of communication should be made immediate and universal, that is, covering the whole region. In order to do that, however, there must be some kind of physical connection between the different telephone systems. There must not be simply a physical connection in a locality, but a universal physical connection such as we have today between the railroads of the country.

The Problem of Intercommunication.

The problem is to get that intercommunication, to get that co-ordination of lines without destroying the vitality of the little individual units, and without ruining and destroying the capital invested in each of those individual units. The problem would be easy if the facts were similar to the railroad problem, but there is one great, almost universal, company stepping in here—the Bell—claiming the right to monopolize the whole business; first in the field on account of its patents, and now claiming supremacy over all and refusing in many cases to connect its lines into any universal system that it does not absolutely dominate.

There are three parties interested in the solution of this problem of co-ordination of the telephone business, whereby the service may be extended, efficiency increased, and useless waste of capital prevented. They are, the public, the Independents, and the Bell. As one of the public, a lawyer without retainer from either of the other parties, I shall speak mainly from the standpoint of the public.

Now, the problems that are before us legally and are before the Independent companies, are the problems that were before the railroad companies. How to make an adequate connection without consolidation of the railroads is one of them.

The principles governing the consolidation of these public utilities are essentially the same in fundamentals as the principles governing the consolidation and control of railroad companies. What are those principles? One of them was declared, and declared for all time in this country, by Chief Justice Waite in the decision of Munn vs. People of Illinois. It is this: That when a business has grown to such an extent that it affects the public generally, when its property affects the public interests generally, it becomes what we lawyers call "affected with a public interest." When it is affected with a public interest, the public has a right to control and regulate that utility or that business.

Regulation by Police Power.

The railroad business long years ago, from its similarity to the general carrying business that then existed was declared a public utility, a public business, and the governments undertook to and have regulated it. They regulated it by the police power.

Now what is the police power? I took issue with the Wisconsin Railroad Commission in the case that I had. They placed the right to make a physical connection upon what we call the right of eminent domain. When you take property by the right of eminent domain, you must pay for it. You cannot interfere with a man's property of any kind, or take it under the right of eminent domain, without paying for it. But in the exercise of the police power, which is the inherent power of the government to control for the public welfare, every business and the activities of men, the government can control the practices and even the rates of public utilities without making compensation.

That is a very important thing, and the court conceded that that was the power under which the commission acted when it compelled a physical connection at La Crosse. In other words, it was not a taking of the companies property, but it was the exercise of a legitimate police power by which those corporations were regulated. It was the right of the community to insist that those corporations have a physical connection, that thereby the community might be benefited. It was not for the benefit of the Independent corporations or the Independent telephone companies that this order was made; it was for the benefit of the public. And the state exercising its police power compelled that physical connection.

The Minnesota Physical Connection Bill.

You have before the legislature of this state, a bill requiring physical connection—a bill in my opinion, most excellently drawn. It requires a good many other things. It is House Bill No. 21. In my opinion it should be passed.

It should be passed, first, for the reason that it benefits the public; and, second, because it is, in my judgment, the only way that the Bell company can be controlled in its practices and Independents be kept in the condition of being able to compete. Now, that bill requires a physical connection, as did our bill in Wisconsin. I think it is preferable to ours in some respects because it is clearer. That bill in one section requires a physical connection of all telephone exchanges and lines, and gives the commission power to compel the connection by order when the companies do not agree upon the terms and agree upon such physical connection. A hearing is had. If it is of interest to the public, if the public will be benefited, that physical connection is ordered.

This bill, in my judgment, will be declared constitutional.

You Independent fellows have been afraid of your own bills. I have been told repeatedly by Independent telephone men that they do not believe the constitutionality of the Wisconsin statute will be sustained. Why, of course, it is going to be sustained! In substance it has been sustained by the United States Supreme Court in half a dozen cases. It was sustained in the great case which came up in this state, of the Wisconsin & Minnesota Ry. Co. vs. Jacobson.

A law, essentially the same as this law, was passed requiring railroads to make physical connection of lines and agree upon rates. I can cite a decision in the Supreme Court of the United States which declares, for instance, that the A. T. & T. Co. is a common carrier of messages; that brings it under the same law which applies to common carriers of other things, and which also applies to railroads.

Physical Connection of Railroads in Minnesota.

In the Minnesota railroad statute, which the proposed Minnesota bill follows, and which for that reason will be declared constitutional, it is provided that the commission may order physical connection of railroads. The commission ordered physical connection not simply of railroads that did not compete, but of competing railroads; and the railroads said: "Why, we are going to lose business. It is unconstitutional. It is a taking of our property. It is a wrongful exercise of the police power of the government. It is contrary to the constitution of the state of Minnesota and contrary to the federal constitution." But the supreme court of this state and then the Supreme Court of the United States, in that case, decided that it was constitutional.

The Railroad Commission of North Carolina ordered two railroads which did not make connections, to make connection at a junction point. The railroads said: "That will cost us more money than the freight and passenger traffic is worth. It is illegal. It is unconstitutional. It takes from us the right to manage our own property."

And the Supreme Court of the United States said: "You have got to make that connection. The government, the people and their police power have the right to insist that you make that connection for the benefit of the public."

The railroads said: "The commission has found that it will cost us $40 a day to run that thing, and we are earning only $25 a day."

The court said: "That does not matter. It is the right of the state. It is the right of the nation to see that that connection shall be made for the convenience of the nation. You are a public service corporation, and it is part of your duty to make that connection."

They made it, and it holds.

The other day—I say the other day because it is in the last volume of the Supreme Court reports, a railroad in Iowa said: "We will not take the coal cars of other railroads coming in from Illinois without unloading every pound of coal onto our own cars. We have a right to have our own cars used. You have no right to take our cars from us in that way." But the Supreme Court of the United States said in that case: "That is a legitimate exercise of police power. The Iowa commission has a right to compel you to take these cars and carry them. You have got to do it and do it without any arbitrary, too."

Our Wisconsin law has been, in principle, sustained, and in my judgment your law will be sustained.

Let us see what the Supreme Court of the United States has declared. Years ago a railroad company owned a stage line which we will call stage line A. Some other member of the public, owned another stage line called stage line B. Both connected with a depot town. The railroads said to stage route B, "Since we don't own anything of your stage line, and since we own and control stage line A, we won't accept any passenger that comes from stage line B."

They did not put an arbitrary on it. They put on the absolute veto that they would no longer accept any man coming over that line. They found that proposition lasted about as an icicle would in the infernal regions when it got to the Supreme court. The Supreme court said, "You, railroad company, are a common carrier. It is true you own stage line A, but you have no right to discriminate between the right of the public to use stage lines A and B. You must receive them alike."

The question of compelling by law the physical connection of the telephones of different, and possibly competing companies, is only a phase of the greater question of the relation of public service corporation to the public, and of their mutual obligations and rights. Just as there have been two radically different theories of the functions of the state or of the government—one, the "laissez faire," or "let alone" theory, holding that government should do little more than keep the peace and administer justice; the other holding that it is the duty of the state to legislate broadly for the general welfare—so there have been two distinct theories of the obligations and rights of public service corporations. The holders of the one theory regard public service corporations essentially the same as other private corporations, and as having the absolute right to regulate as their stockholders and managers please, their practices and rates. The holders of the other theory regard them as instruments of the public, owing their first duty to the public, and not to their stockholders.

The earlier legislation and decisions of courts leaned markedly to the former theory, while later legislation and decisions as markedly lean toward the second theory, and favor regulation and control in the interest of the public.

A recurrence to fundamental principles is frequently of great value in understanding and solving problems, and this is especially true in regard to what we might call social or governmental problems. A recurrence to the fundamental principles underlying governmental, or state control, of public utilities, is of value here, because the right of the state to order physical connection of telephone lines or switchboards, and the right to fix the joint rates for the use of the plant of each corporation, depends upon, and is based upon, certain fundamental principles. These fundamental principles have been laid down, from time to time, by the courts, generally in contests between the state and public service corporations other than telephone companies.

I realize the difficulty of a lawyer accustomed to addressing courts in the technical language of courts, making his meaning always clear to an audience such as I now address, and for that reason will take special care to make myself understood.

I say there are certain fundamental principles, or ideas, if you please, controlling the relations between the public and public service corporations, or as they are sometimes called, public utilities, like railways, light and power plants, the telegraph and telephone companies.

Public's Right to Regulate Public Utilities.

These are some of them. When a business affects the public interest, or private property is employed in a manner which directly affects the body of the people, this business or property, becomes affected with a public interest. When a business becomes affected with a public interest the public, through the legislature, may regulate the business and fix reasonable rates or charges. This, abbreviated, is the language of the great opinion of Chief Justice Waite of the United States, in Munn vs. People of Illinois (94 U. S. 113). A decision which forever fixed the right of the people to regulate public service corporation and every occupation directly affecting the body of the people of a state or locality. A public service corporation owes its first duty to the public and not to its stockholders.

The regulation of the practices of a public service corporation is referable to, and by means of, the police power of the state. By police power I mean the general power of a government to preserve and promote the public welfare by prohibiting all things hurtful to the comfort, safety, and welfare of society, and establishing such rules and regulations for the conduct of all persons and the use and management of all property as may be conducive to the public interest.

This power is an attribute of sovereignty inherent in all governments. Acting by virtue of this power, the state may regulate, and even destroy private property, without compensation. If, however, by the exercise of its police power, the state or a municipality requires the public utility to yield to the public the use of its facilities, reasonable compensation for such use must be provided for. Any regulation that prevents the public utility earning a reasonable return on its invested capital, used and useful in its business, is unreasonable or confiscatory, and, therefore, is unlawful and unconstitutional. Acting by virtue of its police power, the state may control capitalization, forbid or allow monopoly, restrict dividends, fix rates, prescribe apparatus, require common carriers, like railroads, to construct switches and connecting lines with competing carriers, prescribe connections, and compel the hauling of the cars of its competitors. From analogy, because it may do these things, the state, I shall show, may compel physical connection between the lines and switchboards of the Bell companies and their Independent competitors, prescribe service and fix rates for the joint use of the facilities of each, provided always, however, that such regulation is reasonable and the rates fixed are reasonably compensatory for the service required.

Discriminating Policy of the Bell in Early Days.

In the early days of the telephone no attempt was made to regulate practices or fix rates. The Bell companies during the life of their basic patents had an absolute monopoly. The managers of the Bell companies seemed to have considered their companies merely private corporations, owing no duties to the public. They assumed the right of giving service to one and refusing to another under like circumstances. They made special contracts with the one company, or individual, stipulating that service was not to be given to a competitor. For example, they made a special contract with the Western Union Telegraph Co. disabling themselves from giving service to, or connection with, the office of another telegraph company, and agreeing not to enter into competition with the Western Union. They were repeatedly in court endeavoring to sustain their unsocial practices, and upholding the doctrine, that as a private corporation, or corporations, they could serve whom they pleased, and make such discriminatory contracts as they pleased. The courts, applying the common law, set aside the contract with the Western Union as contrary to public policy, and laid down the rule that as public service corporations they must serve all alike. That the Bell companies were guilty of these unsocial practices (I mean practices hostile to the interests of the public) is not a matter of mere argument or assertion. The court reports contain a public and indestructible record of them.

When the Bell patents expired, the Bell companies should have been so intrenched in public esteem, by the adequate and complete service they had rendered at reasonable rates, that competition by Independent companies would have been undesirable and practically impossible. But the Bell companies, up to the time of the expiration of their patents, were constantly guilty of unsocial practices. They refused generally to extend their system to small towns or rural neighborhoods. They were content to get the cream of the business, and refused the remainder. They did not adequately serve the public. Their rates, in many cases, were exorbitant. When their patents expired their unsocial practices had developed such hostility that the public favored the Independent companies and associations, at least they did in my state. Towns and neighborhoods which the Bell companies had neglected or refused to serve, had their Independent companies or associations, and thereby obtained service; and in many cases the Independent companies invaded the larger towns and cities in competition with the Bell.

The result of this competition, on the whole, was good; localities which had no service obtained it; rates were reduced and service generally improved. But with this competition of the Independents there exist certain evils. Two of these evils, namely, unnecessary duplication of lines and exchanges, and frequent inability to communicate over the lines, local and toll, of a company other than the subscribers, led the state of Wisconsin to pass its present laws putting the whole business under the control of the railroad commission, forbidding unnecessary duplication, and requiring, under certain circumstances, physical connection, even of competing lines and exchanges.

Because Wisconsin was one of the first to adopt such laws, and because the people, and, at last the Independent companies and associations, heartily favor them, a synopsis of them may be proper here. The telephone is declared a public utility.

Wisconsin Railroad Commission's Power.

Section 1797m-2. "The railroad commission of Wisconsin is vested with power to supervise and regulate every public utility in this state, and to do all things necessary and convenient in the exercise of such power and jurisdiction."

Section 1797m-3. "Every public utility is required to furnish reasonably adequate service and facilities. The charge made by any public utility for any heat, light, water or power produced, transmitted, delivered or furnished, or for any telephone message conveyed, or for any service rendered or to be rendered in connection therewith, shall be reasonable and just, and every unjust or unreasonable charge for such service is prohibited and declared unlawful."

Every public utility is compelled to allow, on payment of reasonable compensation, the use of its poles and conduits to another utility whenever public convenience and necessity require it, and such use is not substantially detrimental to the utility owning the lines; and, further, "every utility for the conveyance of telephone messages shall permit a physical connection or connections to be made, and telephone service to be furnished, between any telephone system operated by it, and the telephone line operated by another such public utility, or between its toll line and the toll line of another such public utility, or between its telephone system and the telephone system of another such public utility, whenever public convenience and necessity require such physical connection or connections, and such physical connection or connections will not result in irreparable injury to the owners or other users of the facilities of such public utilities, nor any substantial detriment to the service to be rendered by such public utilities. The term 'physical connection,' as used in this section, shall mean such number of trunk lines or complete wire circuits and connections as may be required to furnish reasonably adequate telephone service between such public utilities."

In case of failure of the utilities to agree upon such connections or upon the terms and manner of connection, or upon the manner of use and the compensation for the joint use of the facilities of each, the commission may hold hearings and make an order covering these matters, to set aside which order any party interested may, with 90 days, com-

mence an action against the commission as defendant in the Dane county circuit court to vacate or modify the order. All testimony taken at the hearing before the commission is before the court, and new or additional evidence may be introduced, but if such additional evidence is introduced, the court may return the whole matter to the commission, which may vacate, modify, or amend its first order, and upon such new order, if the commission make a new order, the court enters its judgment. Any public utility may surrender its franchise and receive from the commission an indeterminate permit to do business, and practically all public utilities have done so.

ANTI-DUPLICATION AND PHYSICAL CONNECTION STATUTES.

When there is a public utility engaged in the business of furnishing local telephone service no one furnishing similar service can erect lines or install an exchange in the municipality, except by getting a certificate of necessity from the commission. This is the substance of the anti-duplication statutes.

The utility already existing, however, may be compelled by the commission to extend its lines and give adequate service, and on failure so to do another company or party may install its service on application to the commission. Any telephone company or citizen interested in the matter may apply for physical connection in behalf of himself and the public. These are the main provisions of the Wisconsin anti-duplication and physical connection statutes.

You see at once that to forbid duplication, without compelling a physical connection on reasonable terms, would greatly benefit the Bell company, because it would forever prevent the Independents and the localities served by the Independents alone from reaching many of the larger cities of the state, served only by the Bell. The Independents desired physical connection and the Bell desired anti-duplication. The real interests of the people demanded both; but an anti-duplication statute alone would be exceedingly detrimental to them. The present anti-duplication and physical connection statutes of Wisconsin were agreed to and accepted by both the Independents and the Bell companies at the time of their enactment; but their operation has been constantly hampered by the Bell company, notwithstanding its express acceptance of the statute before the legislative committees.

The provisions of this statute have been either directly or in principle upheld by courts of last resort. The right of the state to delegate to a commission the duty of declaring what rates are reasonable and of enforcing the law as to practices, is no longer doubted. In Wisconsin & Minnesota, etc., Ry. Co. vs. Jackson (179 U. S. 287) the Federal Supreme Court upheld a judgment of the state court sustaining the Minnesota law, decreeing physical connection of railways, and an order of the Minnesota Railway Commission ordering physical connection of competing railways by means of switches. In this case the method of awarding compensation was practically the same as the Wisconsin law. This decision holds that in the exercise of its police powers the state may pass a law compelling connecting switch tracks. In Railway vs. North Carolina Corporation Commission (206 U. S. 1.) the same court sustained an order of the commission requiring connection between trains of different carriers, even if made at considerable loss. In Grand Trunk Railway vs. Michigan Railway Commission (231 U. S. 457) the same court sustained a Michigan statute, and an order of the commission requiring the receiving at a junction point of cars of a competing carrier, the hauling of the same to a terminal switch track and the affording of facilities for unloading.

A similar order of the Iowa Railroad Commission, requiring a railway to accept, without unloading into its own cars, freight when tendered at a junction point by another railway in its cars, was upheld in the recent case of Chicago, etc., Railway Co. vs. Iowa (233 U. S. 334). These are the leading cases, but many others might be cited.

While the Supreme Court of the United States has not yet been called upon to interpret or enforce a law requiring a physical connection of telephone lines, there can be no doubt what its decision will be. It has decided the case in principle by upholding laws and orders requiring physical connection of railways. The only supreme state court passing on the law requiring physical connection of telephones is that of California, which in a decision directly contrary to the above, held the law unconstitutional, Pacific Telegraph & Telephone Co. vs. Eschleman. In this case the California court assumed to criticise some of the foregoing decisions of the Federal Supreme Court, and, in substance, refused to follow them. This Eschleman case has been severely criticised, and shown to be actually contrary to the great weight of authorities. (See note to Eschleman case in 50 L. R. A., N. S. 652.)

The Oregon public utilities law contains the following case: The Oregon commission, on the application of the owner of a hotel having both the Independent and Bell systems, ordered a physical connection, and fixed a differential of three and one-half cents. The Bell company asked the United States district court of Oregon for an injunction. The court, three judges sitting, sustained the order of the commission, on the authority of the Federal cases I have cited, and expressly disapproved of the California case. While this is not a court of last resort, it possesses high authority. The right to order a physical connection is based upon the police power of the state.

As we shall show herein, the circuit court of Wisconsin has recently sustained the physical connection law, and I have no doubt it will be sustained when it reaches the courts of last resort. *(To be Continued)*

Some Cut-Out Trouble.

We have often read in TELEPHONY of difficult pieces of trouble that various linemen are sent out to clear, says one of our readers, who is in the employ of a large railroad company.

Would like to call your attention to some trouble that came on one of our lines recently, and was reported as a cut-out. Two of our inspectors were sent over to fix it, and were unable to locate the trouble. Later on, after the matter had been reported several times, a third inspector was sent over the line. He located the trouble, which was that the person who used it stuttered. The man who reported the trouble as a cut-out, was notified, which straightened matters out.

Mountain States Company's Annual Report.

The annual report of the Mountain States Telephone & Telegraph Co., of Denver, Colo., for the year ending December 31, 1914, shows a gross income of $7,817,545, an increase of $224,394 over the previous year. Deducting the expenses, leaves a net income of $3,003,036, an increase of $158,462 over the preceding year. Dividends to the amount of $2,108,568 were paid during the year, while $7,000 were set aside for the benefit fund. This left a surplus of $818,468, an increase of $2,061 over the surplus left at the end of 1913.

Annual Report of Tri-State Company, of St. Paul, Minn.

The annual report of the Mountain States Telephone & Telegraph Co., of St. Paul, Minn., shows a total operating revenue of $1,634,762. The operating expenses were $890,299. Deducting all expenses leaves a net income of $440,963. Dividends to the amount of $367,963 were paid during the year, leaving a surplus of $73,000.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Paul Hamilton

Quiz Questions on the Preceding Installment.

The answer to these questions will be found in the reading section bearing the same number. Answers are not to be sent to TELEPHONY for criticism. For the benefit of those desiring the advantages of a correspondence course, the Engineering Extension Department of the Iowa State College has volunteered to answer questions and criticize replies to questions and solutions of the problems which will be presented from time to time in connection with the course. No charge will be made for this service and the offer applies to all subscribers of TELEPHONY regardless of whether they live in Iowa or elsewhere. Correspondence should be addressed to the Engineering Extension Department, Iowa State College, Ames, Iowa.

71. Give one reason for making magnets in the shape of a horseshoe.

72. What is magnetic polarization by induction? Cite an example from your experience.

73. What relation have the ampere-turns of a solenoid to its magnetic field?

Practical Talks Just Among Ourselves.

Once upon a time, and not very long ago either, there was a man who had a telephone. Like several other people, he couldn't see the advantage of just "having a telephone." He didn't have any appreciation of the great amount of research science had made in his behalf. No sir! He wasn't satisfied with just "having a telephone." The man actually wanted it to work. Yes sir! He did for a fact. You've seen unreasonable people like that. I have—armies of them. He couldn't appreciate the pretty little nickel gongs on their mounting of highly polished oak, and the glistening pedestal with its bright new transmitter and the pretty green silk cord leading to the black symmetrical receiver. He was color blind to all those things—lacking in artistic taste perhaps, or temperament. Oh no! No, he wasn't lacking in temperament. Even if he was not temperamental, he was surely tempestuous. But let me go on with the story of this unreasonable man who wanted his telephone for something besides an ornament.

He wanted it to work, not when it happened to, but when he wanted to use it. Unreasonable? Well, maybe not. And even at that remote day there was some mogul down at the telephone office in a swivel chair who agreed with him and made life miserable for the men who reported "O. K. on test" times without number.

Oh, I see! You want to know what the trouble was? The telephone men didn't find any trouble, but the man claimed it "balked," "cut off," "went by fits and starts," "acted like a nuisance generally." There you have it. Now you know what the trouble was, a "loose connection." Sure, that's what they all thought, but somehow no one of them ever found it. One of them did find a convenient place on the rug to lay a hot soldering iron, but what good did that do?

Finally a fellow came along who had the theory of that telephone in his head. Funny place to carry tools, wasn't it, when tool kits, with gilt letters on them, don't cost much? Strange to say, the theory this fellow carried had cost him more than a dozen tool kits.

When he came into the office, the man shouted orders to "clear away" in order to make room for the display of paraphernalia, from brass washers to bench-hooks, but somehow before half the furniture had been pushed to the wall, it was discovered that the clearing away would not be necessary. Sometimes you don't need a wagon load of tools to put a theory to the test.

Somewhere in this fellow's mind the idea developed that the combination between the receiver and transmitter was wrong, so he removed the receiver and replaced it with a small head telephone. Then he tested the transmitter carefully. It responded to every impulse with apparent perfection. Then he took the receiver and gave it an examination. He found the magnet poles did not set true on a line with the edge of the shell, one pole projecting higher than the other. This brought the diaphragm closer to one pole of the magnet than to the other. Under certain conditions it would vibrate far enough during a conversation to freeze to the end of the pole momentarily.

The imperfection was so slight that without the theory of the action of the receiver it would not have been noticeable. This is but one illustration of hundreds where the application of theory in practice is invaluable to a telephone man. It is the intention to expound the theories and their application in this course. If your head is well stocked with theories, someone else will carry the tool kit for you.

CHAPTER IV. Elements of Magnetism (Continued).

74. *Analysis of a typical magnetic circuit.* In the light of what has been said, let us take an ordinary telephone relay of standard type and analyze its magnetic circuit, remembering that the lines of force start from one pole and reach it again, after traversing the entire circuit including the magnet itself. Such a relay is represented in Fig. 21. The dotted lines represent the path of the magnetic lines of force produced by the winding. It should be noted that while the lines of force travel, for the most part, through the iron, there is a short distance between the pole and the armature which they must travel through the air. It

is possible to force nearly 3,000 times as many lines of force through iron as through air with the same ampere turns. It will be very clear that the largest part of the ampere turns in a telephone relay, and in fact almost any type of pulling magnet, is required to force the total flux

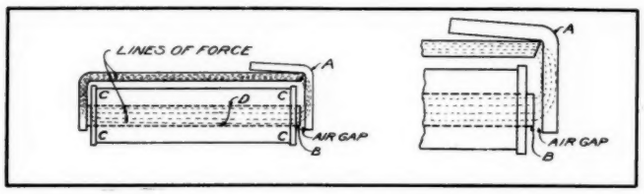


Fig. 21. Relay Frame Showing Path of Lines of Force.

through the comparatively short air gap between the pole piece and the armature.

At this point it would be well to recall the rule given to explain the attraction of a magnet for another mass of iron. The rule is that any mass of iron placed in the magnetic field will, if free to move, so place itself as to include in its own mass the greatest possible number of lines of force.

The relay armature *A* will approach its lower end to the pole *B* when the flux is created in the magnetic circuit of the relay by a current circulating through the winding. It will embrace some of the lines of force ordinarily extending wholly or partly through the air between the pole and the end of the frame.

The telephone relay is an example of a solenoid with an iron core and is typical of nearly all electromagnets. It should be noted that the iron frame is extended around to the front so that the magnetic circuit is that of the horseshoe type. Inasmuch as the armature is likewise of iron, the actual length of the path necessarily traversed by the magnetic flux through air, is made very short. Owing to the greater reluctance of air as compared with iron, it is apparent that it will be found economical in magnetizing force to design any magnet so that the air gap is as short and of as large sectional area as mechanical and electrical considerations permit. An illustration of this is the soft iron armature furnished with experimental horseshoe permanent magnets. Some items of telephone apparatus, such as induction coils, require a magnetic circuit of greater reluctance than would be required in an electromagnet such as a relay or a drop.

The shorter path through air for the magnetic flux, afforded by the horseshoe type of magnet, reduces the total reluctance of the magnetic circuit as it would exist in the same magnet in bar form. Therefore, for the same magnetizing force the flux in the horseshoe type will be greater and its attractive power more than the sum of the attractive power of both poles of the bar magnet.

In the design of an electromagnet such as the telephone relay shown in Fig. 21, the ampere-turns required to force the requisite magnetic flux through the core, would first be calculated. We should then proceed to calculate the ampere-turns required to force the same flux through the frame and also through the armature. Finally the ampere-turns necessary to create the same flux in the air gap would be calculated. The total number of ampere-turns required for the operation of the relay would be the sum of the numbers obtained by these separate calculations. The number of lines of force to be provided, would be determined by the mechanical resistance to be overcome by the armature in operating the contact springs. For instance, for a pull of 5 1/3 ounces per square inch, 5,000 lines of force per square inch would be required. For a pull of 272 pounds per square inch, such as is required in large lifting magnets, 140,000 lines of force would be needed for each square inch of surface.

75. *Permeability or modifying power of iron.* The magnetic circuit is similar in many ways to the electric circuit. While there is a striking similarity, we find one element in the design of the magnetic circuit that has no parallel in the other. Permeability of iron is its modifying power affecting the increase of magnetic flux due to increase in magnetizing force in the magnetic circuit. We have seen how to determine the number of lines of force created in air by a solenoid. It has been found that when a given solenoid is provided with an iron core, the number of lines of force or the total magnetic flux in its magnetic circuit, is greatly increased. This is true, although the number of ampere-turns per inch of magnetic circuit remains the same in both cases. It might be supposed that if the ampere-turns were then doubled, the magnetic flux would also be doubled. This, however, is not true, although up to a certain limit, doubling the ampere-turns increases the flux more or less. The reason that the magnetic flux is not increased in the same proportion as the ampere-turns, is because the permeability or modifying power of the iron core is not the same at all values of the flux.

A condition familiar to every telephone man might be used as an illustration of the meaning of permeability. The labor in stringing a pair of wires through an empty conduit in an elevator shaft is very slight when the conduit is empty. With each pair of wires installed, the difficulty of adding another pair is increased, until a point is reached when it is plain that no amount of additional labor will suffice to run another pair of wires through the conduit in question. In other words, one hour's labor produces less and less in the way of results as the conduit becomes filled.

In the same way, a certain magnetizing force will create a certain flux or number of lines through a certain magnetic

Ampere-turns per inch in length of magnetic circuit	Lines in air per square inch, *H*	Permeability or modifying power of iron	Lines in wrought iron per square inch, *B*
3.06	9.8	3060	30,000
8.76	28.0	2175	60,000
33.80	108.0	830	90,000
626.00	2000	60	120,000

Permeability Table for Wrought Iron.

circuit and will maintain the flux at a constant value. With a 10 per cent. increase in the magnetizing force, the flux will be increased somewhat but not 10 per cent.—for illustration say 8 per cent. A further increase in the magnetizing force of 10 per cent. will only increase the flux then

present, say 5 per cent. The permeability of the iron in the magnetic circuit has become less and less as the flux flowing through it has been increased.

A permeability table for wrought iron is presented to make this clearer to the student:

When the magnetic flux through a magnetic circuit has

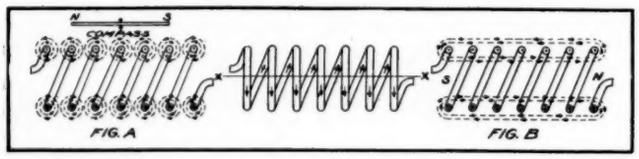


Fig. 22. Sections of Solenoid Showing Origin of Magnetic Field.

such a value that additional ampere-turns, or magnetizing force, produce the greatest relative increase in flux, the iron is being worked at its point of greatest permeability. When additional ampere turns, or magnetizing force, produced no increase in the flux, the iron is working at the point of magnetic saturation. The permeability or modifying power of an iron core is equal to the number of lines of force produced in the iron divided by the number of lines of force that would be produced in air by the same solenoid without an iron core. This is expressed in the formula:

$$\text{Permeability} = \frac{B}{H} \quad (2)$$

where B=magnetic flux with iron core and H=lines of force in air without iron core for same magnetizing force.

The important aspect of the entire magnetic circuit, not only in telephony but in every branch of electrical industry, renders it extremely important to grasp its underlying principles. The operation of every relay and drop follows the laws of the magnetic circuit. Every choke coil, impedance or retardation coil is dependent for its satisfactory operation on that property of iron in a magnetic circuit known as its permeability or modifying power.

If these elements of the magnetic circuit are not clearly understood, TELEPHONY is sure that a little more time devoted to their study in a book devoted to the subject will clear the doubtful points. It is well worth the trouble.

76. *Magnetic field of a solenoid.* We have seen how each wire carrying a current is surrounded by a whirl of magnetic lines of force in concentric circles with the wire at the center; also that the direction of whirl of these lines of force bears the same relation to the direction of the current in the wire as the rotation of a screw bears to its motion back and forth. Whenever the wire carrying a current is coiled into a solenoid or helix, it becomes a magnet. When an iron core is added, the iron core exhibits all the properties of a magnet so long as the current in the solenoid is uninterrupted.

If it were possible to slice the solenoid from end to end in the same way as a log is cut when it reaches the sawmill, and still have the current flowing in its coils, we should find an individual magnetic whirl due to the current for each wire, and the magnetic spectrum would have the appearance of Fig. 22-*A*. This is assuming that it is possible to separate the individual sets of magnetic whirls due to the individual wires. As a matter of fact, there is no way to do so. The rule of the rotation of the screw as a means of determining the direction of the current in a wire, applied to the wires shown in the top of the solenoid, proves that the compass needle, if it were placed above the solenoid, would be thrown in the same direction by each one of the individual magnetic whirls, also that it would be deflected in the same direction again if it were placed below the solenoid.

An exploration with the compass of the field in the center of the solenoid would show that the magnetic lines there traveled in the opposite direction from those outside of the helix, both above and below it. This will be recognized as an exactly similar and identical condition with the one encountered in the magnetic spectrum of a bar magnet. It explains why the solenoid shows all the properties of a magnet whenever a current is sent through its coils. It is a magnet for the time being and when the iron core is placed inside the solenoid, the greater permeability of the iron merely causes the magnetic flux of the whole combination to be greatly increased.

(To be Continued)

Back Home

Some Reflections—Danger of Complimentary Speech

By J. C. Kelsey

I talked from San Francisco to New York! It was really a gruesome thing to do. As I listened to the New York man read the New York paper, I felt just a little bit frightened. It seemed unreal. It occurred to me that I might be dreaming.

A woman sitting near was not so impressed. She said it was a fraud, that the man was in the next room and that the phonograph was on the exposition grounds. She merely echoed the incredulity which has existed thousands of years. She could not believe that a man was sitting at a telephone in New York.

Before I go further, I am going to say how dangerous it is to say something nice about the Bell company. Once I wrote a story about conditions in Winnipeg. A year later the Bell lawyers produced that copy, all neatly bound and gilt-edged, and asked me if I ever wrote such a story. I certainly admitted it. It did not hurt me a bit, yet I learned that in the merciless game of business, there is no place nor time to say anything agreeable or pleasant about a concern which is a natural enemy.

And there is another point. A reader of TELEPHONY wrote me telling how the Bell factory salesmen are commenting upon our broad-mindedness; how we had seen the error of our way and had come to realize what a beautiful thing universal service was or is.

For several years I have tried to steer through the conflicting mazes of telephone life, and after many years' experience I fully know that under the present conditions it is impossible to be anything but partisan.

Great numbers of our readers have made a satisfactory

deal with the Bell company. They feel that the war is over and we should open our pages to every side of the telephone business.

It is a fact that a bitter partisan article meets more protest than approval from our readers. Nevertheless, there is a "nigger in the telephone woodpile." That nigger is the Bell missionary operating in the guise of a Bell factory salesman.

Many of our readers have commented upon the fact that TELEPHONY's personal column has more news of the Bell transfers than our own; but that is the fault of the very ones who complain. They should send in news which will interest all of us. We should have a running fire of Independent personals. How are we going to get them, if you don't send them in?

It is dangerous to comment upon the conversation from New York to San Francisco, merely because transcontinental speech is now being heralded by the Bell factory salesman as a proof of the superiority of Bell transmitters. We all know something about this particular point, yet it is bound to affect the new man coming into the telephone business.

I never was in a fair transmission test in my life where a Bell transmitter was found superior—it was usually found inferior. I have seen Independent telephone men taken to New York, in order to let the experts there demonstrate the alleged superiority. Yet in no case has a sale ever been made when based on fair tests.

Now, this may seem to be trivial, but if every telephone man would put himself in the manufacturer's place for a minute, he could not help but see the point.

In the first place, he will see a great manufacturing concern, with a monopoly of the Bell business, trying to divide the business of Independent telephone men with the men who worked night and day to equal Bell apparatus and surpass it. He will see a Bell salesman who does nothing but visit, usually a nice fellow, and doing everything in his power to controvert the conditions of telephone life as they really are.

Before I start on the transcontinental story, I want to state plainly that it is not a question of transmitters. I can name several makes of transmitters and receivers that could easily handle the ocean to ocean service, yet how ridiculous it is to argue over things which have become standard.

The joke of the whole matter is that Dr. Bell's original transmitter will work on this line just as well as the devices of today. That point, alone, should suffice to neutralize any transcontinental transmission argument.

Getting back to the exhibit at the San Francisco Exposition, the Bell interests have a very tasty exhibit. At each seat in a sort of a theater are two receivers which are put into use after a young man finishes his lecture. After the lecture, about 1:30 p. m., the man in New York begins a monologue.

The business day in New York is now done. The New York business man has gone or is going home, because it is half past four in New York. In San Francisco, the business man has returned from lunch, and is ready for business. So the long line is then used for exhibition purposes.

Now, I wonder if you would care to put your money into a long distance line from New York to San Francisco. You know you can't do too much business on a toll line, even in eight hours; but what can you do when you have a day of three hours?

The New York man reaches his office at nine o'clock—it is a fallacy that New York begins work at ten. The Frisco man is still sweetly sleeping in the bracing air of the Golden Gate—it is 6 o'clock there.

Before he gets to business he will sleep an hour longer. He will get up leisurely, shave himself as a gentleman should, eat breakfast and proceed to his office.

The New York man puts in an early call. When the Frisco man reaches his office, the New York man is becoming hungry—his stomach instead of his mind is in the ascendency. Anyway, the Frisco man calls up and between 12 and 1 o'clock in New York, the conversation takes place.

So far the day is half done and only one useful and valuable hour has been available for the long line. Then the New York man goes to lunch, while the Frisco man begins to feel the pangs of hunger. The Frisco man calls the New York man between 10 and 11, but the New York man is out at lunch, his watch tells him it is between 1 and 2. The Frisco man must wait.

From two to four o'clock Frisco and New York carry on conversation, then Frisco goes to lunch. It is 1 o'clock there. It takes its lunch as seriously as the New Yorker. The New York man sits in his office from four to five o'clock waiting for Frisco. Then he closes his desk and goes home, because his train won't wait.

The day has had but three telephone hours.

After I heard the woman express her doubt that the New York man was really delivering his monologue in New York, I jokingly remarked to Mr. Richards, the famous transmitter expert, that I would believe it better if I could talk to someone in New York.

The very next day, as I passed the exhibit, I was told by Mr. Peck and Mr. Richards that Mr. Pickernell was ready to talk to me. I went into the booth with my heart beating so fast that I could hardly speak. I timidly said: "Hello, Mr. Pickernell." Instantly there came back, "Hello, Kelsey, how are you?"

There was no mistaking his voice. It came clear and strong. At last I was talking from ocean to ocean! My dream has come true!

Now there was another feature of this conversation extending 3,400 miles over mountains, under rivers and with the various weather conditions. My family of three listened to the conversation, and Harry Goldrick's family of five and Mr. Richards and Mr. Peck as well. Even my five-year old could follow the conversation. Each one of them wore two receivers.

Finally Mr. Pickernell's train would wait no longer—it was after five o'clock—and the conversation stopped.

The wonderful part of this achievement lies in the fact that since you and I were born, the telephone came to the service of man. Still more curious is the fact that the first two men who ever talked over a wire, between two laboratory rooms, were the first two men to officially talk over the long ocean to ocean wire.

On March 10, 1876, the struggling pair of workers, Bell and Watson, as if in a dream, discovered that human beings could transmit speech to a distant point. On January 25, 1915, these same men, now wealthy and on the declining side of life, talked over a wire between two rooms separated by the width of a great continent.

I think it can be safely said, without the danger of controversion, that the telephone has no reason for shame in comparison with other advances of science. The Philadelphia Exposition was a brilliant exhibition of gas lighting. The electric lamp and telephone were but feeble exhibits.

The San Francisco Exposition, but a few years later, is bathed in the most spectacular electric lighting scheme the

world has ever seen. Wireless telegraphy flashes from its towers and aeroplanes fly, dive and turn back-somersaults over its beautiful creations.

The telephone truly has kept the pace.

I can't finish this story without telling of a conversation which one of my Frisco friends overheard. Theodore Vail, at Jekyll Island, Georgia, talked to Major Higginson at Boston, with New York, Washington and Baltimore listening in. Yet at San Francisco, this man heard every word uttered during this conversation along the limits of the Atlantic Coast.

What a shame it is that an institution which should be and could be great, cannot be so. Why is it that the Bell interests cannot see that every telephone man in America is in the same boat, rowing to the same object, and facing the same perils? What an idiotic thing it is that men in the telephone business should ever have the least worry about their commercial lives!

What a foolish thing it is for men to engage in commercial civil war. Yet in our telephone lives, today, it looks as if civil war will be our only remedy for the present intolerable and unfair conditions surrounding the telephone business.

It is fine to be broad-minded. But it is equally foolish to try to be when every word is controverted, even prostituted, to some doubtful and even illegal end.

We should get more out of the telephone business. There is too much ash. We should live better. We should have less worries. We should be able to laugh more. There is no business which meets all the difficulties and emergencies of life as easily as the telephone business.

You can realize the strength and virility of the telephone business when you think that the Bell company and the New Haven railway were operated by the same minds and ideals. The great railway was hopelessly ruined, but who can say that the telephone industry is not still solvent?

It is a striking example of the strength of the telephone business.

I am proud of the fact that I had such an opportunity as I did. True, I could have paid $21 for the opportunity of talking from ocean to ocean, but coming as it did, I got a truly scientific insight into it. I talked to one of the best telephone men in the world, and even he felt, as I did, somewhat awed by the splendor of the achievement.

What a pity we cannot all, as telephone men, take pride in this matter, and express it without the possibility of some employe using it to sell some telephone apparatus made at a Bell factory.

The older I grow and the more I look into the affairs of life, the more I am puzzled by the mixture of smallness with what could be real commercial greatness. Some men, and this institution particularly, have the sad faculty of spoiling great things by some ridiculously small trick.

When men or institutions undo their work—really great and good and deserving—by some foolish, and worst of all, some unprofitable action, I call that the rankest inefficiency of them all.

Somewhere in the Scripture, someone expressed himself as preferring to be a doorkeeper in Heaven to being a prince in darkness. Somehow, it reminds me that the Bell telephone interests would rather sell a magneto switchboard or telephone than to occupy the proper place in the hearts of men. There is more rejoicing over the sale of a telephone to an Independent telephone man than winning a kingdom. Queer, isn't it?

MORAL: No one should be ashamed of the telephone business.

Michigan State Telephone Co.'s Annual Report.

The annual report of the Michigan State Telephone Co. for the year 1914 shows an operating revenue of $5,953,884, an increase of $397,182 over the preceding year. The operating expenses were $4,821,183, and the non-operating expenses, including rent, interest, etc., $1,019,054. Deducting all the expenditures from the gross income ($5,996,383) leaves a net income of $156,101. This leaves a balance of $154,418 for the corporate surplus.

The comparative statement of income and expenses is as follows:

	1913.	1914.
Operating revenues	$5,556,702	$5,953,884
Operating expenses	4,016,812	4,821,183
Net operating revenues	$1,539,890	$1,132,701
Deductions (taxes and uncollectables)	413,583	366,296
Total operating income	$1,126,307	$ 766,405
Non-operating revenues	35,922	42,454
Total gross income	$1,162,229	$ 808,859
Deductions (rent, interests, etc.)	750,824	652,758
Balance net income	$ 411,405	$ 156,101
Dividend appropriations of income	408,372	.....
Other appropriations of income	.....	1,683
Balance for corporate surplus	$ 3,033	$ 154,418

The surplus account, as of January 1, 1914, is as follows:

		1914.
Corporate surplus account January 1, 1914		$665,510
Credit balance transferred from income account		154,418
		$819,928
Deduct divided appropriations 1914:		
On common stock	$270,000	
On preferred stock	240,000	
	$510,000	
Minor adjustments of surplus (net)	1,570	511,570
Corporate surplus account—December 31, 1914		$308,358

Annual Report of Canadian Telephone Business.

According to the annual report of the comptroller of statistics of the Railways and Canals Department, J. L. Payne, the telephone business of Canada is steadily increasing, while the telegraph business shows, for the past year at least, a decrease in earnings. The telephone business of Canada for the year ending June 30, 1914, showed an increase of more than $2,250,000 in gross earnings, while the telegraph companies reported a decrease of $112,000 as compared with 1913.

Gross earnings of the telephone companies last year totalled $17,297,268, with gross operating expenses of $12,882,402. The net earnings were $4,414,868. The gross earnings were equal to $33 per telephone in use, and the operating expenses averaged $24 per telephone. The total number of telephones in use is 521,144, or one for every 15 persons. Statistics show that Canada is next to the United States in the number of telephones per capita.

Pennsylvania Bell Company Reports Prosperous Year.

The Bell Telephone Co., of Pennsylvania, reports gross earnings of $20,312,536 for the year ending December 31, 1914, or an increase of $1,377,625 over the preceding year. The operating expenses for the year were $7,761,976. Maintenance and replacements were placed at $6,540,717. The total operating expenses, including $654,769 for taxes, amounted to $14,957,463. The net earnings were $5,355,073, an increase of $495,344 over the previous year.

Dividends to the amount of $3,600,089 were paid during the year. Deducting that amount and the interest charges from the net earnings, left a surplus of $1,289,184, an increase of $50,767 over the year 1913.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Minnette Bill Passed by the Minnesota Senate.

One of the amendments to the Minnette bill, adopted by the Senate committee of the Minnesota legislature, strikes out the referendum feature of the measure, under which a competing telephone system may be given a permit in a municipality on a 65 per cent. vote of the people. As amended the bill provides that a competing company cannot be granted a franchise in a community except by the state railroad commission.

The other amendment changes the section under which applications are made for physical connection of toll lines. The bill provided that when such application was made, it should be presumed that a public necessity existed. This put the burden of proof on the company resisting the application. The amendment provides that the railroad commission shall first determine whether a public necessity exists.

As TELEPHONY goes to press, word is received that the bill, as amended, by the Senate committee, was passed by the Senate on Wednesday, March 24.

Los Angeles Merger Question to be Submitted to Voters.

The city council of Los Angeles, Cal., has issued a peremptory order to the Pacific Telephone & Telegraph Co. and the Home Telephone & Telegraph Co. that one of them will have to go out of business or lose its identity through absorption by the other. The council has also decided to take a straw vote of the people, at the general election in June, to ascertain if the public desires one telephone system. The resolution adopted is as follows:

Whereas, there are now two independent telephone systems doing business within the city of Los Angeles; and

Whereas, the franchise of one of such systems expires on November 20, 1916; and

Whereas, this council has formally adopted a resolution to the effect that on and after the expiration of such franchise only one telephone system shall be authorized to do business within said city; and

Whereas, the question is one of great public importance, and an expression of the people is deemed proper thereon by this council; now, therefore,

Be it resolved, that the city attorney be instructed to prepare the necessary wording and transmit the same to the city clerk, providing for the submission of this question to the people at the general election to be held in June, and that such question be substantially in the following terms:

"Shall the city of Los Angeles refuse to authorize more than one telephone system to do business in the city of Los Angeles on and after November 20, 1916?"

The franchise of the Pacific Telephone & Telegraph Co. expires November 20, 1916, while the Home company's franchise has some 37 years to run.

City's Right to Order Wires Underground Disputed.

With threats of raising rates on the one hand and threats of revoking franchises on the other, the cities of Long Beach and San Bernardino, Cal., recently locked horns with the Union Home Telephone & Telegraph Co. before Commissioner Edgerton of the California Railroad Commission on the question of putting wires underground.

Both Long Beach and San Bernardino have adopted ordinances to compel the telephone company to place its wires underground in fire districts.

The company has petitioned the commission for an order to prevent the enforcement of the ordinances; and if unsuccessful in obtaining a restraining order asks for permission to raise rates and for authority to issue bonds to make the changes required to put the wires underground.

The city officials of Long Beach have filed a petition in intervention, denying the telephone company's right to raise rates if wires are put underground, and also making a counter-threat of revoking the franchise of the company.

Los Angeles Utilities Board Urges Measured Service.

The Los Angeles, Cal., board of public utilities recently went on record in favor of measured telephone service for business telephones, adopting the following resolution:

"Resolved, that the board of public utilities of the city of Los Angeles favor measured service for business telephones for the Los Angeles exchanges of the Pacific Telephone & Telegraph Co. and the Home Telephone & Telegraph Co., during the ensuing fiscal year, and that both companies be so notified."

Both companies have been strongly urging the board to adopt such a rule to be enforced when the telephone rates for the year 1915-16 go into effect.

That it is unfair to the small subscriber to charge just as much for unlimited service on a business telephone of a small tradesman or office, as for a big concern handling thousands of telephone calls daily, is the contention of the telephone officials.

Johnstown, Pa., Competing Companies Must Equalize Rates.

As a result of a protest filed with the public service commission by the Johnstown (Pa.) Telephone Co. against the discriminatory rates, charged by the Bell company between Johnstown, Portage and Ebensburg, the commission ordered the Bell company to charge a toll of 10 cents between the towns named. The Johnstown company alleged that the Bell company had been charging a five-cent rate for all kinds of service between the points mentioned, while it had been charging a 15-cent rate for the same service. The Bell company was, therefore, doing practically all of the toll business in those localities on account of the five-cent rate which the Johnstown company alleged was discriminatory.

Under the new schedule to become effective April 1, the Johnstown company is required to lower its schedule to meet the 10-cent schedule of the Bell company between Johnstown and Portage and Johnstown and Ebensburg, maintaining its 15-cent rate between Johnstown and Cresson, because the Bell company under the new schedule is permitted to charge a like amount. The rate for service between Johnstown and South Fork and Johnstown and Windber will remain at five cents as at present.

Investigation Into Regulations of Waco Public Utilities.

Complaints made by several citizens of Waco, Texas, that the electric light and gas companies of that city were unreasonable in their rules and regulations affecting customers, has resulted in the city commissioners in Waco undertaking to examine the rules of the other public utilities companies operating there, with the view of determining their reasonableness. President J. B. Earle, of the Texas Telephone Co., has been asked by the commissioners to present the rules and requirements of that company as to

the payment of accounts, extension of service, installation of telephones, etc.

The telephone company has agreed to act with the city authorities in framing a set of rules and regulations which will be agreeable to both the company and its subscribers, the same to be embodied in a subscriber's contract, which will be approved by the city, and which the telephone company may require all subscribers to sign. The matter will be passed upon by the city commission within the next few weeks.

Telephone Bills in Wisconsin Legislature Postponed.

The Wisconsin senate committee has recommended for indefinite postponement, by a unanimous vote, the Weissleder bills, No. 320S and No. 319S. The first-mentioned bill provides that no telephone company be permitted to collect rental for its service more than one month in advance. The other measure provides that slugs be used by a subscriber as prepayment for telephone service and that he be held responsible for all coins found in his telephone instrument.

A number of Bell and Independent representatives present at the hearing opposed the first measure on the ground that transient patrons would leave bills unpaid and the companies be obliged to stand the loss, which would aggregate a large sum.

The telephone representatives also opposed the slug bill on the ground that it would widen still further the opportunity for fraud. General Manager Seymour, of the Wisconsin Telephone Co., displayed a pocketful of beer checks, washers and bad coins generally to show to what a large extent the telephone boxes are made of now to obtain telephone service without paying for it.

"This bill would allow such frauds," Mr. Seymour contended. "We can't pay expenses on such forms of income. Telephone companies don't establish coin boxes as collection agencies or for negotiating promissory notes. The nickel service provides patrons with means of paying as they go. The United States coin is the only proper medium for all payments."

Slotted slugs are used in Chicago, but the system has numerous defects, which Mr. Seymour pointed out.

Texas Public Utilities Commission Bill Killed by Senate.

The Texas Senate committee on internal affairs recently killed the bill introduced by Senator Gibson and others, providing that telephone and telegraph companies be placed under the control of the state railroad commission, by postponing indefinitely consideration of the measure.

Summary of Commission Hearings and Rulings.

March 18: St. Peter Telephone Co., St. Peter, Ill., given permission to change rates and discontinue discriminatory rate.

March 18: Mt. Carroll Mutual Telephone Co., Mt. Carroll, Ill., given permission to discontinue discriminatory rate.

March 18: McNabb Mutual Telephone Co., McNabb, Ill., given permission to discontinue discriminatory rate.

March 18: Purchase of Pickneyville (Ill.) Telephone Co. on January 31, 1914, by the Perry County Telephone Co. approved and purchasing company given permission to issue $15,000 capital stock.

INDIANA.

March: Application filed by the Northern Indiana & Southern Michigan Telephone & Telegraph Co., of La Grange, Ind., for permission to issue $50,000 worth of bonds, $25,000 to be used in retiring a bond issue of a like amount and $25,000 to be used in improvements. The company also filed a complaint against the Peoples Mutual Telephone Co., of Wolcottville, Ind., contending that it had made connections with another company to the detriment of the petitioner and that it had failed to comply with the orders of the commission.

March: Application filed by the Central Union Telephone Co. and the Delaware & Madison County Telephone Co., of Anderson, Ind., for the approval of the sale of the latter to the former, the purchase price being $100,000 and 5 per cent. interest on the value of the Delaware & Madison County property from August 26, 1912, till the date on which the sale is consummated.

March 23: Hearing in regard to petition filed by the Whitley County Telephone Co., of Columbia City, Ind., asking that free physical connection be established with the Farmers Mutual Telephone Co., also of that city.

March 24: Hearing in regard to application of the Logansport (Ind.) Home Telephone Co. for permission to increase its rates.

KANSAS.

March 23: Hearing on application of the receivers of the Baxter Telephone Co. for permission to increase its rates at Baxter Springs, Kans.

March 25: Hearing in regard to application of the Spivey Telephone Co. for permission to increase its rates at Spivey.

March 26: Hearing at Kiowa, Kans., on application of the Hartner Rural Telephone Co. for a certificate of authority to transact business as a telephone company.

April 1: Hearing on application of A. J. Stephens for permission to lease his telephone plant at Horton, Kans., to the Northern Kansas Telephone Co., which also operates a telephone plant at Horton, and to consolidate the two plants and fix rates.

NEW YORK.

March 2: Complaint of residents of Newark and Lyons, N. Y., against the Wayne Telephone Co., alleging that its rates are excessive, dismissed. The commission upon investigation found that the rates charged by the defendant in the towns named were not unreasonable.

March: Order issued establishing a schedule of rates for New York City. Schedule is effective July 1, 1915, and makes a reduction in rates in greater New York, amounting to $3,000,000.

OHIO.

March 22: Receivers of the Central Union Telephone Co. authorized to purchase all of the exchange farmer lines, equipment, apparatus, etc., of the Farmers Tri-County Telephone Co., of Magnolia, Ohio.

April 20: Hearing in regard to the protest of the Lima, Ohio, city council against the rates, service and legality of the Lima Telephone & Telegraph Co.'s action in raising its charges above those specified in the franchise ordinance of 1895.

OREGON.

March: Application filed by the Oregon-Washington Telephone Co., of Hood River, Ore., for authority to increase its rates 25 cents on all monthly charges to patrons and to be allowed to give a discount in this sum if the bill is paid before the tenth of each month.

WASHINGTON.

May 15: Hearing on the valuation of the properties of the Pacific Telephone & Telegraph Co. in the state of Washington. On the valuation to be fixed, as a result of this hearing, telephone rates, both for exchange and toll service, will be based.

WISCONSIN.

March: Application of J. T. Henton and 33 other subscribers, for improved service by the Leeds Farmers' Telephone Co., Leeds, Wis., granted. The company has been ordered to improve service by repairing and maintaining in proper condition the lines and equipment. It is further ordered to discontinue its exchange known as "Sleeve's Central" and transfer the lines to "Peterson's Central"; to reconstruct its lines No. 24 and 32, making them full metallic circuits; to construct a line for through service from Rio to Zink's Switch; to comply with the standards for telephone service fixed by the commission; to restore its telephone service to John P. Roche; improvements to be effected by July 1.

March: Order dismissing the petition of the Bangor (Wis.) Telephone Co. for an order requiring the Chicago, Milwaukee & St. Paul Railway Co. to discontinue operation of its automatic electric signal system on its line at Bangor or contribute to the expense of the telephone company in changing its telephone line along the railroad from a grounded to a metallic system. The telephone company complained that the railroad's signal system carried such a high voltage that it greatly interfered with the operation of telephone lines paralleling the tracks.

March 23: Hearing in the case of the Western Crawford Farmers Mutual Telephone Co. vs. the Union Telephone Co. U.—755.

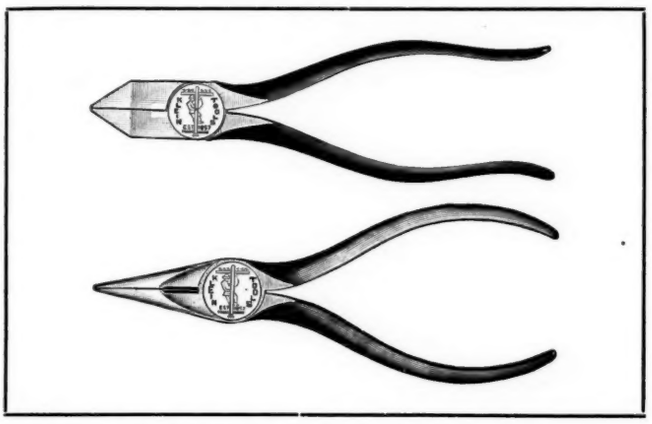
From Factory and Salesroom

Convention: Eastern Pennsylvania, Harrisburg, April 7, 8; Tri-State, Memphis, Tenn., May 21, 22

New Klein Pliers Placed on the Market.

Mathias Klein & Sons, of Chicago, manufacturers of linemen's, electricians' and construction tools, have recently placed on the market two new designs in millinery pliers.

These new Klein products have been created to meet a



Klein Pliers for Fine Silk Covered Wire.

wide-spread demand for pliers which will effect a clean cut without breaking silk covered wire and with safeguards against the possibility of the wire becoming caught in the joint. This desirable essential is accomplished by means of lap joint construction as opposed to the box joint pliers.

These new pliers are made of the same quality of tool steel, hand forged, which characterizes all Klein pliers.

Economy in Clearing Trouble on Farmer Lines.

By Chris D. Stewart.

Economy in clearing trouble depends first of all on efficiency in testing. The writer has read a number of articles on toll line testing, but farmer lines do not seem to be in the running. Toll line trouble should, of course, be cleared promptly and that means that efficient testing is necessary. When considering the number of farmer lines as compared with the number of toll lines, it would seem that there would be more trouble on farmer lines and hence more testing. Therefore, farmer line testing should have a place equal to toll line testing.

Toll line trouble is much easier to locate than farmer line trouble owing to the bells on the farmer lines. Also it is seldom that there is not a telephone man at both ends of a toll line so that if the tester wants a short on the other end of the line, there is some one there to put it on for him. Even if farmer lines did not have bells to interfere with the tests, there is no one at the end of the line to short it for the tester so that a loop test can be made.

As the loop test is the only test that does not take into consideration the resistance of the fault, it is the only test that will give an exact location every time if the tester never made a mistake. The loop test can not be made on farmer lines but a series test with proper apparatus can be made with all the accuracy that other conditions allow.

The writer has had much experience in farmer line testing, having been wire chief for a period of five years in an exchange where there was a large farmer development. During this period he found that the series test is correct about nine times out of ten and when it is not, the error is in favor of the tester, for the trouble is never farther out that it tests. That is, if the trouble tests five miles out, it cannot be farther and if a man is equipped to go five miles, he will sure get to the trouble.

Of course a lineman can go over a line without a test and find the trouble by just looking for it, but does it pay? That is, he can cover the line and inspect every telephone and eventually find the trouble. In this case, if the line were 15 miles long, he would go prepared to cover the whole line. Of course, he would take a team. Now if the trouble was found five miles out, it would cost the telephone company for the hire of a team. If, however, a location was made on this line and the trouble found to be only five miles out, it would be seen at the time of hiring the livery, that the trouble could be cleared with the use of a single rig, thus saving the difference in cost between a team and a single. If the trouble tested out only half a mile, it could be cleared without any livery, and the tester would know it. Also when trouble shows on a line in the afternoon, one can tell whether to start on it or wait till morning.

By series test, we mean testing out over the fault and back. A testing current for this kind of testing should equal or exceed that of the signal service on the line. By this is meant it should be as strong as the generator used for ringing the bells. When using a current of this strength, crosses that would be slight to a small testing current would break down and be dead crosses to a current of proper strength. For example, the writer has many times heard linemen say they have talked over a short. They did not because the line was not short to voice currents but was short to ringing or testing current.

These tests can be made with a voltmeter properly shunted, with a galvanometer of the correct type or with the Stewart Resistance Meter. As voltmeters and galvanometers and their functions are well known, no description of them will be given.

The Resistance Meter is a new instrument in the telephone field, so a brief description of it and its workings will be given. It is a meter having a pointer the same as a voltmeter and is so arranged that it will measure non-inductive resistance direct in ohms the same as a voltmeter reads volts. It has push button keys mounted in the same case and is so arranged that it is to be used with a bridging telephone. When so used, the two make a very efficient test board, the telephone for talking on a line and the meter for testing.

To measure resistance with a voltmeter, the writer has found the following formula the simplest:

Call the resistance of the voltmeter R; the maximum deflection D; the deflection through resistance d; and the resistance to be measured x.

Then $x = \frac{D}{d} \times R$.

In measuring resistance with the Resistance Meter, the resistance is read direct on the scale.

To measure the resistance of the line to a fault with the voltmeter, it is necessary to include the line and fault and battery and voltmeter in the circuit. If the particular trouble is a short, connect one side of the voltmeter with one side of the battery and one side of the line with the other side of the voltmeter, the other side of the line to the remaining side of the battery. In practice, this is done by switching keys so that to test a short, or ground, it is only necessary to press certain keys. Take a reading with the line short-circuited right at the voltmeter. Suppose this

reading is 45, and a reading taken through the trouble is 16. Assume the resistance of the voltmeter is 200 ohms when shunted. The resistance to the trouble would be:

$$\frac{45}{16} \times 200 \text{ or } 281 \text{ ohms, nearly.}$$

As iron wire has a resistance of about 6. ohms per circuit mile, the trouble would be out nearly 4.4 miles. That is 281÷64 equals 4.4.

In cases where there is cable used, the resistance of the cable can be deducted before changing the resistance to miles. Where cable is used, the resistance to the end of the cable, after it is once determined, can be kept and it will only be necessary to figure this once. To find the resistance to the end of the cable, short-circuit a pair in the cable box and measure it.

To measure the resistance of a line to a short with the Resistance Meter, connect the line to the terminals marked L_1 and L_2 on the meter. Then push the button marked 3 and turn the crank on the telephone. The resistance in ohms may then be read off the scale of the meter.

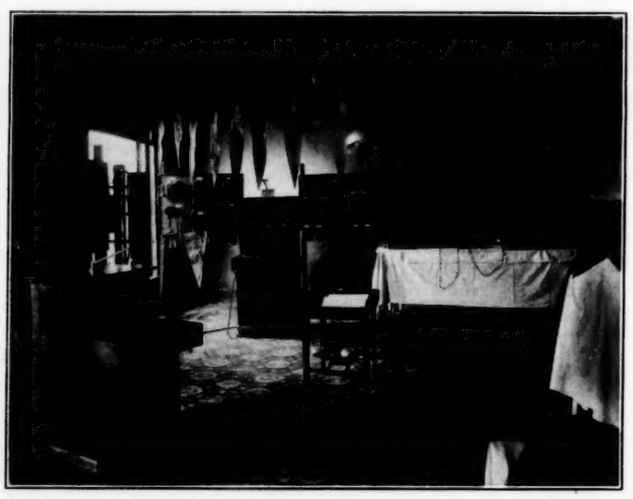
To tell how many miles it is, if the line is of iron wire, divide the number of ohms by 64. Cards are furnished with the Resistance Meter so that the distance in miles can be found without any figuring. However a set of cards can be made up with a voltmeter so that after the resistance is found, the number of miles can be found off the cards. It is necessary to figure to find the resistance as it is impossible to keep a constant voltage.

Stromberg Exhibit at Iowa State Telephone Convention.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., had an interesting exhibit at the convention of the Iowa Independent Telephone Association, held recently at the Chamberlain Hotel, Des Moines.

The apparatus was neatly mounted on panels in such a way that the various parts could be readily inspected. The magneto telephones were connected up to the A-5629 switchboard and the central energy telephones were connected to the A-5597 P. B. X. switchboard in such a way that demonstrations could be given.

The Call-A-Phone created considerable interest, as it was



A Center of Interest and Attraction at Iowa Convention.

connected up not only with bells but with lamps around the exhibition floor that flashed the signals. The magneto equipment was very complete and included not only a switchboard but a vertical of Cook's main distributing frame with heat coil arresters and a Holtzer-Cabot ringing machine.

The accompanying illustration shows very well how the exhibit was decorated with penants and banners setting forth the merits of Stromberg-Carlson apparatus.

The Stromberg-Carlson company was represented by H. T. McCaig, C. W. Schafer and M. S. Van Vleet. Some very good orders were taken during the convention, the company officials state.

Automatic Telephone Co., of Urbana, Ohio, Re-Organized.

The W. B. Marvin Mfg. Co., of Urbana, Ohio, has recently been incorporated to carry on the business formerly transacted under the name of the Automatic Telephone Co., which was a successor to the American Automatic Telephone Co. The reorganization and change of name was caused by the death of W. B. Marvin, late owner of the Automatic Telephone Co. The capital stock of the new corporation is placed at $50,000 and the officers elected are as follows: President, C. H. Marvin, Jr.; vice-president, W. M. Johnson; secretary and treasurer, D. S. Colwell.

Paragraphs.

The Western Lumber & Pole Co. has moved its headquarters from the Electric Building, Denver, Colo., to Spokane, Wash.

W. N. Matthews & Brother, of St. Louis, Mo., have originated a unique style of advertising which is known as the Matthews Cake Campaign. The latest step in this campaign is the mailing out of a postal card depicting a telephone man asking a jobber's salesman: "What is this Matthews Cake Campaign?"

R. S. Mueller, of Cleveland, Ohio, manufacturers' agent and warehouseman, has issued a stock sheet, dated March 20, of magnet wire in Cleveland stock, "for the man who buys." A copy of the stock sheet may be obtained upon application. Mr. Mueller represents Alfred F. Moore, Philadelphia, Pa., the Scranton Button Co., Scranton, Pa., Anchor Webbing Co., Woonsocket, R. I., and the Mica Mfg. Co., New York.

Statement of Telephony's Ownership.

Statement of the ownership, management, etc., of Telephony, published weekly, at Chicago, for March 15, 1915, required by the Act of August 24, 1912.

Name — Post Office Address

Editor, H. B. McMeal, 4147 Drexel Boulevard, Chicago.

Managing Editor, S. R. Edwards, 317 S. Oak Park Avenue, Oak Park, Ill.

Business Manager, H. D. Fargo, 4932 Kenmore Avenue, Chicago.

Publisher, Telephony Publishing Co., Monadnock Block, Chicago.

Owners: Names and addresses of stockholders holding 1 per cent. or more of total amount of stock.

H. B. McMeal, 4147 Drexel Boulevard, Chicago.
H. D. Fargo, 4932 Kenmore Avenue, Chicago.
J. C. Kelsey, 1131 Lunt Ave., Chicago.
I. B. Lipson, 4947 Vincennes Avenue, Chicago.
E. M. McMeal, 4147 Drexel Boulevard, Chicago.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of the total amount of bonds, mortgages and other securities:

F. S. Kenfield, Augusta, Mich.
E. J. Baker, 410 Diversey Parkway, Chicago.

(Signed) H. B. McMeal, Editor.

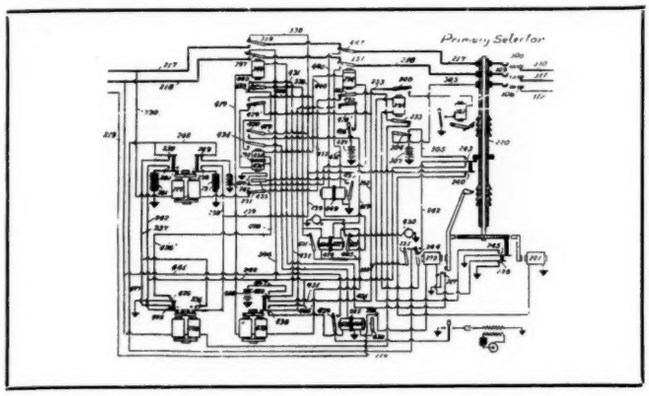
Sworn to and subscribed before me this 15th day of March, 1915. Walter Brown,

[SEAL] Notary Public.

(My commission expires June 3, 1918.)

Record of Telephone Patents Recently Issued

1,126,701. February 2, 1915. SEMI-MECHANICAL TELEPHONE SYSTEM: A. M. Bullard, (deceased); assigned to Western Electric Co. In this semi-automatic system, the central offices are divided into districts, and district and office selecting devices are provided. Trunk lines lead from the district selector to the different office selectors, the district selecting device

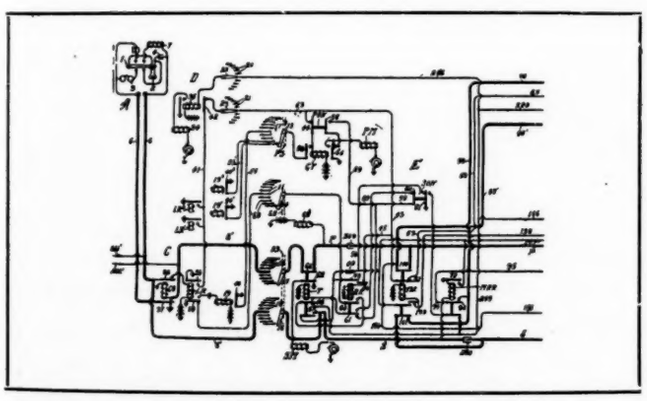


No. 1,126,952.

being adapted to unite the talking circuit with a trunk line leading to an office selecting device in a desired district. The office selecting device extends the connection of the trunk line and talking circuit to a desired office. Keys representing the digits of districts and offices, and means controlled by them, are provided for selectively operating the selecting devices.

1,126,727. February 2, 1915. SELECTOR SWITCH; H. G. Dietl, Vienna, Austria Hungary; assigned to Western Electric Co. In this switch a plurality of brushes are mounted upon a shaft and adapted to traverse a row of cylindrical contacts, some one of the brushes being always in engagement with one or another of the terminal contact plates connected to lines, while another one of the brushes is in a position to engage some one of the other line terminls.

1,126,727. February 2, 1915. SELECTOR SWITCH; H. D. Dietl, bar, Newark, N. J.; assigned to Western Electric Co. A can top type of cable terminal is described. Two opposite sides of a wooden cable head having a closed chamber, are extended and in the extended portions are perforations adapted to receive bridle wires leading into the open chamber. A row of fuse posts is mounted upon opposite sides of the cable head and two rows of combined fuse and arrester supports are mounted upon the third side, the ground plate being secured to the cable head between the last named rows. A tubular fuse is held between each of the corresponding fuse posts and the supports in their respective rows. A pair of



No. 1,126,963.

carbon blocks is supported between each arrester support and the ground plate.

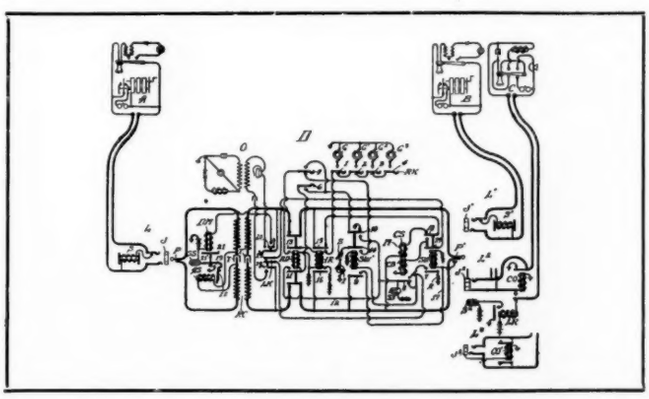
1,126,751. February 2, 1915. RECORDING DEVICE FOR TELEPHONE PAY STATION; M. M. Goldberg, Dayton, Ohio; one-half assigned to V. F. King. In this device a counter and a spring to actuate it, are provided. A manually actuated device for controlling a calling signal is also used to place the spring of the counter under tension.

1,126,803. February 2, 1915. TELEPHONE EXCHANGE SYSTEM; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. In this semi-automatic system the combination is described of a selector mechanism with sender apparatus comprising a rotating controller member having its total arc of travel arranged in successive divisions. Means are provided for operating a selector in unison with the controller member during the travel of the latter through a pre-determined fraction of each division, and independently through the remainder of each division by automatic means.

1,126,804. February 2, 1915. POWER SYSTEM FOR AUTOMATIC SWITCHES; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. Telephone lines are divided into groups and a group of automatic selector switches is provided for each line group to which the lines are multipled. Two power shafts driven from different sources are arranged in operative relation to each group so that alternate switches serving any line group, may be coupled to different shafts.

1,126,952. February 2, 1915. SEMI-MECHANICAL SYSTEM; A. M. Bullard, (deceased); assigned to Western Electric Co. A complete semi-automatic system is described in this patent. A distributor is adapted to select a connector arranged to reach a desired line. A testing conductor extends from the connector through the distributor. Provision is made for completing the continuity of the testing conductor when the connector unites with the desired line. Busy signal apparatus in connection with the test conductor provides a busy signal to the talking circuit in case the called line is busy. There are 143 claims to this patent.

1,126,963. February 2, 1915. SEMI-AUTOMATIC TELEPHONE



No. 1,127,437.

SYSTEM; A. H. Dyson, Chicago; assigned to Kellogg Switchboard & Supply Co. In this system, line selectors, impulse sender selectors, and first selectors are permanently associated in groups of threes. The impulse senders terminate at the sender selectors and a master switch is common to the lines and selectors.

1,127,005. February 2, 1915. TELEPHONE SYSTEM; C. L. Howk, Newark, N. J.; assigned to Western Electric Co. A telephone system for railroad trains is described in this patent. Exchange equipment is carried by each car and is adapted for connection between stations within the same car and between stations in different cars. A condenser normally in circuit with the exchange equipment when the talking circuit for interconnection is completed, prevents short-circuiting of the line. A switch normally in circuit, is operated to remove the condenser from the circuit when connection is established with an outside line.

1,127,161. February 2, 1915. HEAD BAND FOR TELEPHONE RECEIVERS; N. Baldwin, Mill Creek, Utah. A head band adapted for holding two receivers to the ears is described. It consists of a resilient head member with provision at the extremity for automatic adjustment to the ears.

1,127,405. February 9, 1915. TELEPHONE SYSTEM; E. H. Clark, Austin, Ill.; assigned to Western Electric Co. A trunking system with automatically operated selecting switches one provided for each end of the trunk line is described. The switches move in unison to extend the two ends of a trunk

line. The control for the switches for both connecting and releasing is over the talking wires of the trunk line.

1,127,437. February 9, 1915. UNIVERSAL CORD CIRCUIT; J. E. Hilbish, Lagrange, Ill.; assigned to Kellogg Switchboard & Supply Co. A cord circuit for connecting magneto with common battery lines is described. The system comprises a common supervisory signal at the calling end of the cord circuit, a ringing key and automatic and manual ringing apparatus. The ringing key, when actuated, is adapted to effect the association of either the manual or automatic ringing control with the cord circuit according to whether the line connected with is common battery or magneto, respectively.

1,127,466. February 9, 1915. SELECTIVE CONTROLLING APPARATUS; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. The selector controlling mechanism comprises an interrupter with a circuit controlled thereby, a series of electromagnets, with a key for each electromagnet, a responsive device controlled by the conjoint operation of any one of the electromagnets and a controlling key for effecting a change in the controlling circuit of the selector. The apparatus is designed for predetermining and counting the number of current impulses to be transmitted.

1,127,467. February 9, 1915. TELEPHONE EXCHANGE SYSTEM; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. Semi-automatic exchange equipment is described. The feature is the provision of a number of trunks terminating at a common office in selectors individual to the same group of lines, and at the other end at separate exchanges. An overflow trunk having a terminal at one of the separate exchanges and terminating at its other end in an overflow selector having a terminal multipled to one of the trunks terminating at another of the separate exchanges, is provided so that a call may be sent either over a direct trunk or over an overflow trunk.

1,127,513. February 9, 1915. PAPER CONDENSER; A. Pruessman, Chicago; assigned to Western Electric Co. This condenser is of the rolled paper type in a sealed container. The condenser unit is positioned in a container and a compound consisting substantially of 8 per cent. asphaltic cement, 8 per cent. rosin, and 12 per cent. Montan, surrounds it.

1,127,741. February 9, 1915. PROCESS FOR MAKING TERMINAL BANKS; A. F. Dixon, Newark, N. J.; assigned to Western Electric Co. This process for making terminal banks for selector switches consists in superposing flexible insulating sheets, coated with a plastic insulating compound, and metallic strips and subjecting structure thus built up to pressure.

1,127,808. February 9, 1915. SEQUENCE SWITCH; J. N. Reynolds, Greenwich, Conn., and C. F. Baldwin, Montclair, N. J.; assigned to Western Electric Co. It is designed, in this switch, to provide a large number of circuit changes using a minimum amount of apparatus. Several rotary disks are attached to a common gap, certain of the disks being formed with slots and projections to provide a plurality of series of integral contact portions. Brushes are adapted to successively engage the contacts of the series upon the rotation of the shaft.

1,127,876. February 9, 1915. SELECTIVE SIGNALING SYSTEM; J. C. Field, Orange, N. J.; assigned to Western Electric Co. This system is designed for telephone train dispatching. All of the lines emanating from a common station may be operated from a common current source without interference.

1,127,889. February 9, 1915. TELEPHONE EXCHANGE APPARATUS; E. E. Hinrichsen, Alexander, Ill.; assigned to Western Electric Co. The feature of this invention is the provision of apparatus to prevent the central office operator from ringing on a subscriber's line while the line is in use.

1,128,019. February 9, 1915. TELEPHONE CALL RECORDER; D. J. McGauran, Geraldton, Western Australia. Automatic call recording mechanism is combined with a timing mechanism. The latter is adapted to be automatically set in motion for a predetermined time when the exchange calls a subscriber. The movement of the gear of the timing device is adapted to engage with arresting means in case a subscriber answers the call within the prescribed time limit. By means of this device a subscriber may be penalized for not answering within a certain period.

1,128,262. February 9, 1915. TELEPHONE SYSTEM; H. S. Turner, San Diego, Cal. The feature of this system is the provision of means for dispensing with the necessity of an operator using the phrase "number, please?" A variable current under control of apparatus at the calling station causes a visual line signal at the exchange to be energized. At the same time an audible signal is sounded in the calling subscriber's receiver, thus indicating that the line wires and signal means at the exchange are in operating condition. Provision is made so that the operator can discontinue the audible signal thus indicating to the subscriber that she is ready to receive the number he desires.

1,128,279. February 16, 1915. ELECTRIC WAVE AMPLIFIER; H. DeF. Arnold, East Orange, N. J.; assigned to Western Electric Co. The repeating apparatus comprises two audion elements in a unitary structure with two filaments and their corresponding grids, which are placed between them. A common anode plate is placed between the grids.

1,128,280. February 16, 1915. THERMIONIC DETECTOR; H. DeF. Arnold, East Orange, N. J.; assigned to Western Electric Co. A pair of input electrodes are connected to the negative pole of a local input circuit and oppositelv connected to the source of current to be detected. The input electrodes are proportioned to admit of only a small current flowing in the local output circuit.

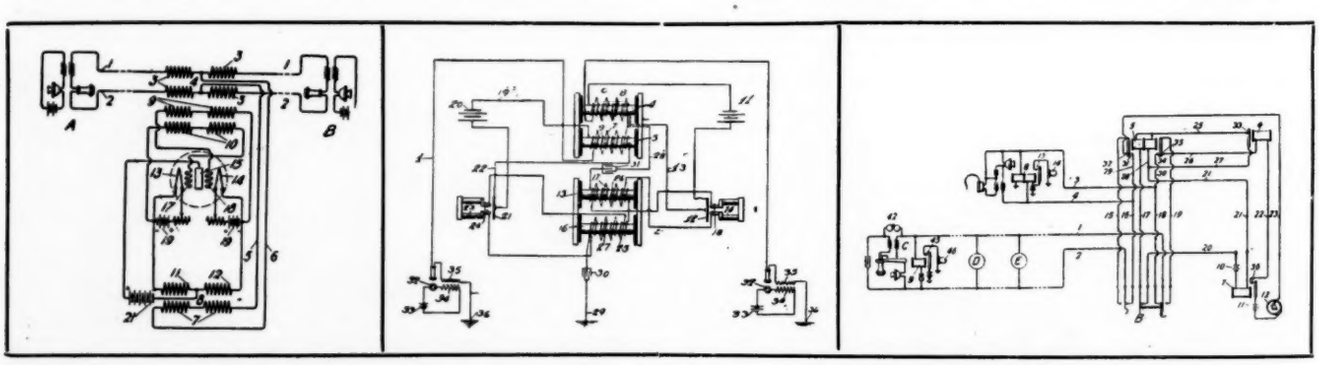
1,128,292. February 16, 1915. ELECTRIC WAVE AMPLIFIER; E. L. Colpitts, East Orange, N. J.; assigned to Western Electric Co. Two vacuum discharge repeater elements are oppositely connected with divided input and output circuits in such a manner that the positive and negative portions of the electric wave in the input circuit are repeated by the repeater elements respectively in the output circuit.

1,128,469. February 16, 1915. AUTOMATIC TELEPHONE EXCHANGE; E. W. Lorimer, Piqua, Ohio; assigned to Western Electric Co. A main starting switch which controls one or more subsidiary switches is the feature of this patent. A current supply circuit for the control relay of the main starting switch is open when all of the subsidiary switches are out of normal position.

1,128,562. February 16, 1915. ELECTROMAGNET; H. G. Webster, Chicago; assigned to Kellogg Switchboard & Supply Co. A telephone relay of the differential type is described. A pair of armatures is adjustably mounted adjacent to the core, one of the armatures having a relatively greater air gap area with respect to the core than the other. The armatures are pivotally supported by a pole piece upon a single aligned axis and are adapted to be attracted by the core. Switching contacts are controlled by the armature.

1,128,646. February 16, 1915. TELEPHONE EXCHANGE SYSTEM; J. L. Wright, Washington, D. C.; assigned to F. C. Stevens, Attica, N. Y. The feature of this system is a special ringing relay and its control. A continuously energized relay is arranged to applying ringing current to the calling end of a cord, or connecting link through its own contact. Means controlled by the calling subscriber are provided to primarily control the action of the relay, while other means, controlled in the establishment of the connection, complete the action of the relay and remove its control from the calling subscriber.

1,128,660. February 16, 1915. CALL DISTRIBUTING TELEPHONE SYSTEM; H. P. Clausen, New York; assigned to Western Elec-



No. 1,128,279. No. 1,128,927. No. 1,128,930.

tric Co. The feature of this automatic call distributing system is the provision of a call counter for registering calls coming into a group of trunk lines and answered by the operator in charge of that group. A call is recorded only when the operator answers and means are provided to prevent the operation when the circuit is made and broken a number of times by the movement of the switch hook at the calling subscriber's station.

1,128,701. February 16, 1915. CENTRAL STATION SWITCHING APPARATUS FOR AUTOMATIC TELEPHONE SYSTEMS; F. A. Lundquist and J. J. Brownrigg, Chicago; assigned to Western Electric Co. The feature of this patent is the provision of a busy test associated with each subscriber's switching mechanism. When the called subscriber's line is busy, a circuit of the busy test magnet of the calling subscriber is divided. Each part includes a coil of each of the two subscribers in communication with each other. The total effective resistance in the circuit of the busy test magnet of the calling subscriber is thus reduced, permitting the magnet to operate to give a busy signal to the calling subscriber.

1,128,777. February 16, 1915. TELEPHONE SYSTEM; C. E. Hague, Rochester, N. Y.; assigned to Western Electric Co. A call distributing system is described in this patent. The feature is a provision whereby all of the private conductors extending to a particular operator's position are caused to test busy whenever two unanswered calls are simultaneously received at this particular operator's position.

1,128,857. February 16, 1915. SELECTIVE SIGNALING SYSTEM FOR PARTY LINES; E. B. Craft, Hackensack, N. J.; assigned to Western Electric Co. In this patent a ringing system for train dispatching lines is described. A selector at a receiving station is adapted to respond to different current impulses to close a circuit through either the armature and winding, or through only the winding of the receiving station bell. Mechanisms at the sending station are provided for sending the current impulses and are adapted to hold current on the line for a period after selecting.

1,128,927. February 16, 1915. TELEPHONE REPEATING DEVICE; E. H. Wilson, New York. This repeating device is adapted for use upon a grounded circuit. The secondary winding of an induction coil is connected to the main line circuit, while the primary winding is in a local circuit containing a source of current and a transmitter. Another primary coil, in multiple with the main line, is connected to the ground. A core is provided for this coil and a secondary coil also wound on it. The secondary coil is included in a local circuit connected to which is a coil having a core which actuates the diaphragm of the transmitter in the primary circuit of the main line induction coil.

1,128,930. February 16, 1915. TELEPHONE SYSTEM; F. D. Young, Lyndhurst, N. J.; assigned to Western Electric Co. The feature in this patent is the provision of means for disconnecting an operator's telephone set which is normally connected to a line from the line and connecting thereto a source of ringing current. An electromagnetic device has a plurality of windings, one of which is normally short-circuited. The removal of a receiver from a switch hook actuates means for removing the short-circuit from the winding. The electromagnetic device is thereupon actuated to disconnect the ringing current from the line and to connect the operator's set to it.

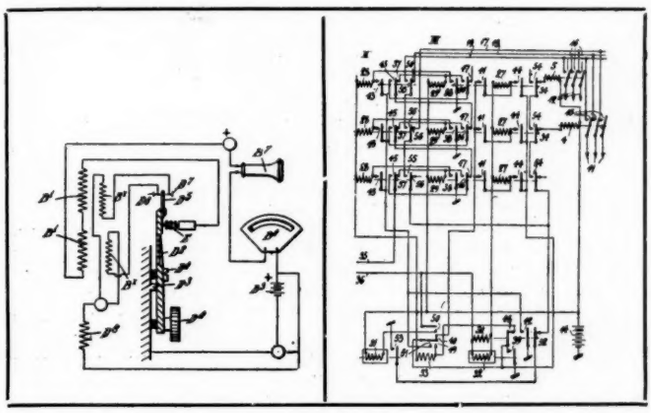
1,128,943. February 16, 1915. TELEPHONE RELAY; S. G. Brown, London, England. A small granular microphone 1/10 of an inch in diameter has one contact piece attached to a vibratory armature associated with a magnet. Windings upon the magnet are connected in series with the microphone. There are other windings on the magnet which are wound counteractingly with respect to the line current windings of the magnet. Means are arranged for co-operation with the vibratory armature to complete the circuit of the counteracting winding when the armature tends to vibrate excessively.

1,128,944. February 16, 1915. ELECTRICAL RELAY; S. G. Brown, London, England. A modification of the previous patent (No. 1,128,943) adapting it for wireless or long distance use, is described. Two contact pieces, about 3/10 of an inch in effective diameter, form part of the local circuit of the relay. One of the contact pieces is placed on the vibratory member, while the other is stationary and placed opposite the first contact piece. They are separated a sufficient distance apart to obviate initial compression of the granular microphonic material which is retained between the contact pieces by a cylindrical rigid wall. The dead weight of the enclosed granules suffices with initially applied pressure to afford the requisite initial conductivity for the local current from one contact piece to the other.

1,129,087. February 23, 1915. TELEPHONE RECEIVER; Elwood Grissinger, Buffalo. The feature of this invention is a provision for imposing a high natural frequency upon the armature or diaphragm. One or two adjacent wires are stretched under high initial tension across the line of movement of the armature and are secured thereto. Means intermediate of the holding ends are adapted for adjustment to deflect the wire from a straight line and transversely to the direction of vibration of the armature.

1,129,357. February 23, 1915. LIGHTNING CONDUCTOR FOR TELEPHONE LINES; M. G. Mitchell, South Bend, Ind.; assigned to National-Standard Co., Niles, Mich. A method is described for connecting the ground section of a telephone lightning arrester with a lightning rod.

1,129,543. February 23, 1915. AUTOMATIC OR SEMI-AUTOMATIC TELEPHONE EXCHANGE SYSTEM; G. A. Betulander, Södertörns



No. 1,128,944, No. 1,129,543.

Villastad, Sweden. In this automatic system connection between lines is effected by means of relays arranged in different combinations. A selector selects and operates combining relays of a number of series of selecting relays. The series correspond to different digits of the numbers to be selected and are adapted to register the current impulses. The selecting relays control circuits for the combining relays.

1,129,840. March 2, 1915. TELEPHONE; H. A. Bates, Galesburg, Ill. The feature of the telephone desk stand covered by this patent is a provision for locking the switch hook against movement while the receiver is upon it, thus preventing any false signals through accidental movements of the hook. The locking mechanism is released when the receiver is taken from the hook.

1,129,951. March 2, 1915. TELEPHONE EXCHANGE SYSTEM; E. S. Browning, Keefeton, Okla. A switchboard is described from which the cords, plugs and jacks are eliminated. A breast-plate having transverse slots is located upon the switchboard. Contacts, forming terminals of certain circuits, are carried by these plates and spaced apart adjacent to each slot. Levers, fulcrumed upon the switchboard and connected with terminals of other circuits, are movable through the slot in the breast-plate. Contacts are arranged on the levers to engage the contacts carried by the plates.

1,130,008. March 2, 1915. AUDION; A. McL. Nicolson, Tarrytown, N. Y.; assigned to Western Electric Co. This audion has an input electrode in the form of a plate having a filament wound about it. The output electrode is in the form of a pair of plates parallel to the input electrode and upon opposite sides.

1,130,009. March 2, 1915. AUDION; A. McL. Nicholson, Tarrytown, N. Y.; assigned to Western Electric Co. This audion has the input and output electrodes in the form of cylindrical shells with a filament arranged spirally about the surface of the input electrode at the side toward the output electrode.

1,130,029. March 2, 1915. TELEPHONE APPARATUS; H. E. Shreeve, Milburn, N. J.; assigned to Western Electric Co. A transmitter with a substantially horizontal diaphragm is described. The main body portion has a chamber which contains comminuted conducting material with movable and stationary electrodes in operative relation to the conducting material. The diaphragm is operatively connected with the movable electrode and is covered with a perforated parabolic cap.

1,130,190. March 2, 1915. TELEPHONE EXCHANGE APPARATUS; C. H. North, Cleveland, Ohio; assigned to F. C. Stevens, Attica, N. Y. Arrangements for installing automanual equipment is described. A unit section is carried by each switchboard frame, each unit section including unit interchangeable groups of apparatus. Each group includes a plurality of inter-

changeable automatically operated selective switching units of different order. Suitable connections are provided between the several sections, between the several groups of each section, and between the several units of each group.

1,130,522. March 2, 1915. PARTY LINE LISTENING IN DETECTIVE DEVICE; C. A. Kramer, Spokane, Wash. The detecting device consists of a small bell placed in each subscriber's set, and arranged so that sound from it will be sent out over the line through the transmitter. Removal of the receiver from the hook to listen-in, causes a hammer to strike the bell.

1,130,608. March 2, 1915. TELEPHONE ATTACHMENT; P. A. Johnson, Springfield, Ore. This attachment is designed to prevent eavesdropping. Removal of the receiver from the switch hook causes a spring motor to produce fluctuation of the line current.

1,130,697. March 9, 1915. AUTOMATIC TELEPHONE EXCHANGE SYSTEM; FOR SUBSCRIBERS' LINES WITH EXTENSION SETS; F. Aldendorff, Antwerp, Belgium; assigned to Western Electric Co. The feature is the provision of a special selector for releasing a P. B. X. circuit and means for transferring control of the special selector releasing circuit to an extension station of the P. B. X. prior to the response of the party at the extension station.

1,130,784. March 9, 1915. MEASURED SERVICE TELEPHONE SYSTEM; B. D. Willis, Chicago; assigned to Automatic Electric Co. A measured service system for use in connection with automatic systems is described. Automatic switches extend a connection from the calling line to an operator's trunk circuit. Provision is made for rendering the calling telephone inoperative when connection is completed with the called line, and operative when the operator connects her talking set with the trunk circuit, without breaking the connection with the called line and before the called subscriber answers.

1,130,971. March 9, 1915. INTERCOMMUNICATING TELEPHONES; W. W. Henry, Wollaston, Mass.; assigned to S. H. Couch Co., Inc., Atlantic, Mass. A wall type telephone set is described. The transmitter mechanism is mounted upon a wall plate of sheet metal and secured against lateral or perpendicular movement with respect to the plate.

1,131,088. March 9, 1915. ANTISEPTIC ATTACHMENT FOR TELEPHONE MOUTHPIECE; I. S. Rosenblatt, San Francisco. An annular sheet metal holder secures a ring of antiseptic material within the transmitter mouthpiece.

1,131,098. March 9, 1915. LINE TESTING SWITCH; J. M. Watkins, Buffalo, N. Y. This line testing switch is designed to localize short-circuits or grounds on telephone lines. The switch, which is controllable from a distant point, cuts the main circuit into two parts. Provision is made for short-circuiting each part so that each may be separately tested.

1,131,140. March 9, 1915. AUTOMATIC SWITCH FOR TELEPHONE SYSTEMS; W. Kaisling, Chicago; assigned to Kellogg Switchboard & Supply Co. Passive contacts are arranged in rows and movable arms are provided having contact ends adapted to engage the passive contacts. A spring retarded shaft actuated by a primary magnet moves the contact ends to select a row of passive contacts, while a second shaft actuated by a secondary magnet moves the contact ends to select a contact in a row. The second electromagnet is also adapted to rotate the contact ends to a position beyond the last contact in the row, thus allowing the contact ends to be automatically restored.

1,131,250. March 9, 1915. TELEPHONE REINFORCING CIRCUIT; C. B. Lanning, Boston, Mass. A series connected repeater is described. A line-actuated line-current reinforcing arrangement is comprised of a receiving element and a transmitting element operated thereby. The receiving element is serially related to the line as is also the transmitting element to the same side.

Rural Telephone Business Undergoing Startling Change

Production of Successful Lockout Device by Adsit Interests of Minnesota Introduces Features Revolutionizing Party Line Methods—Telephone's Birth and Discovery of Lockout Celebrated on Same Day—Story of Inventions Strikingly Similar—Over $250,000 in Orders for Lockouts

To a young Minnesota man, Franklin W. Adsit by name, belongs the honor and wealth now being showered upon him as a result of his perfecting, after seven years of hard study and work, a "lockout" device which practical telephone men, and some of our highest consulting engineers, pronounce the most practical and valuable improvement on the telephone made since the instrument itself was discovered. The final introduction of a practical lockout device into the telephone business of this country has resulted in some remarkable changes in the method of conducting the telephone business, particularly in relation to party lines. It is therefore vitally necessary that the successful operative become thoroughly acquainted with the new situation and adjust his business to meet the new condition as speedily as possible.

ANNIVERSARY OF TELEPHONE AND LOCKOUT.

Two weeks ago last Wednesday was the thirty-ninth anniversary of the discovery of the telephone. And two weeks ago last Wednesday was also the anniversary of the discovery of the basic principle which constitutes the successful operation of the Adsit telephone lockout.

Thirty-nine years ago, on March 10, 1876, Alexander Graham Bell made the telephone actually "talk" to Thomas Watson, his co-worker. Bell had worked seven long years on his idea with little to show for his labor except a mass of theory. One day Dr. Charles Blake said to Bell, "Why don't you use a real human ear?" Bell jumped at the idea, and Dr. Blake cut an ear drum, together with its associated bones, from a dead man's head. Bell arranged these in an old human skull, attaching a straw to the ear drum and placing at the other end of the straw a piece of moving smoked glass.

Could anything be more ghastly or absurd? How would you have interpreted the gruesome joy of this pale-faced young man with flashing black eyes, who stood earnestly singing, then whispering, then shouting, into a dead man's ear? And this all happened in Salem, too, the very home of witchcraft and superstition. Ghoulish it was, but the wizard then and there visualized, for the first time, the art of actually reproducing the vibrations of the human voice, resulting, later, in perfecting the telephone theory.

BOTH TWENTY-NINE YEARS OLD.

On his 29th birthday, Bell secured, as a result of seven years, hard work, United States Patent No. 174,465, known as "the most valuable single patent ever issued in any country." As a singular coincidence, on his 29th birthday, Franklin W. Adsit, then living on a farm near Bellview, Minn., received United States Patent No. 986,260, which many telephone experts predict will ultimately become almost as valuable as Bell's original document.

Another remarkable coincidence in a chain of striking circumstances, marking a strange similarity between the experience of Bell and Adsit, is the fact that Adsit also worked seven years, almost to the day, on the perfecting of his idea.

A NATURAL GENIUS.

They tried to make a Minnesota farmer out of young Adsit, but finally considered him a hopeless case. He had repeatedly let the horses on his cultivator wander along at will, plowing up rows on rows of corn while he, in a trance, sat intensely "watching the wheels" of the machine he was driving. Adsit appears the ideal inventor. He is a futurist, a mechanical poet, a dreamer; albeit a practical one, who sees, always, a different and better way of doing the things now done. He is a positive genius in the matter of formulating and creating new ideas and new methods independent of, and often directly at variance with, established mechanical methods.

The Adsits are prominently recorded in the genealogy of the Barbour and Stanford families, the members of which are noted for many achievements. Franklin W. Adsit, the inventor of the "lockout," is a close relative of DeWitt Stanford, the man who won the United States Government's reward for photographing the first flash of lightning ever recorded on a sensitized plate. Mr. Adsit is also a relative of the late Leland Stanford, of California, who gave the famous Stanford University to California, who fathered the historic Silver Bill in the United States Senate in '63, and who as a crowning achievement to his active life, put the first railroad across the Rocky Mountains—a supposedly impossible undertaking, ranking as the greatest engineering feat of that age, and comparable today with the building of the Panama Canal.

Franklin W. Adsit.

The "Adsit Lockout" is too well known to all telephone men through the vigorous advertising of the company to warrant a full description here. It is a small attachment adaptable to any make of telephone. When used on metallic, bridged circuits, it gives absolute private service and intercommunicating and selective ringing features, to any party line. This, of course, eliminates all code ringing and maintains full 100 per cent. talking efficiency during the conversation. The device is adaptable to both rural and city party lines.

A device somewhat similar to that used on rural lines and embodying the same principle, is made to apply to city party lines and works perfectly when added to the present harmonic ringing circuits.

A Dream Come True.

A successful lockout system or attachment to permit of private conversation on party lines, yet retaining the intercommunicating and selective ringing features, has been the day dream of telephone experts since the telephone itself was invented. Companies located in cities and moderate-sized towns have spent millions of dollars on additional equipment necessary to allow them to give private service to their subscribers.

But to the average small town company and the rural exchanges, private service remained unsolved. Distances between telephones were too great and the tremendous cost of installing and maintaining the large number of wires necessary to afford private service in the usual manner was prohibitive. Nevertheless, the necessity for some means of supplying private conversation in rural districts has become more urgent from day to day.

When all the bells on a line ring, as is the case today on rural party lines, many people are tempted to "listen-in." Some are always "butting in" and "rubbering," while others monopolize the line with talk of the day's washing and why the jell didn't jell, while the local banker is tearing his hair and using strong language in an endeavor to get the "gossips" off the line so that he can close an important business transaction with his brother banker in the next township.

While many of these "line fights" have their comical side, some are more serious. This is the most disagreeable side of the telephone business today. It is not at all surprising, therefore, that the advent of a simple, moderate priced, and thoroughly practical attachment, eliminating present chaotic conditions, should meet with such hearty and wide-spread adoption and support of the telephone companies throughout the country.

Device is Simple.

One of the most remarkable features of the whole Adsit proposition is the fact that the technical description of this device is so simple and the practicability of the machine so evident from the models exhibited at three national and three state conventions where it has been shown, that over a quarter million dollars in both actually signed and trial orders have been booked by the company. This business has come from the telephone companies, covering practically every state in the Union.

The electrical connections between the attachment and the telephone set proper are made through the medium of a five-strand cord, which is connected with the binding posts found on every telephone. This hook-up is so simple that it can be done by the novice lineman. The only attachment needed at the central office is made to the present switchboard in the same simple manner and there is no necessity of "changing over" or reconstruction of any kind. In fact, the central office and a complete line can be equipped with the new instrument in the length of time required by a lineman traversing a line for inspection, perhaps spending only a few minutes at each telephone in order to make the necessary connection.

The new attachment can be put on an entire system at once, or it may be added one line at a time. The improvement pays a big profit to the telephone company besides solving the many harsh and unpleasant problems now endured.

As an indication of the popularity of the invention, a big Chicago moving picture concern has laid a plot and "filmed" the new device in actual operation, on a rural line. Embodied in the movie, as can easily be imagined, is a great deal of humor, pathos, tragedy and human interest, resulting in a feature film which is in great demand throughout the rural communities.

The new device is not only an improvement in the service to subscribers and a money making proposition for the telephone company, but it is also a means of advancing the moral tone of any community in which it is operated. The possibilities of its uplifting influences are plainly evident when one considers the demoralizing effect on young boys and girls, acquiring from their parents the habit of "listening-in" on a party line. They not only hear conversations of a nature unsuited to any but adult ears, but it is also quite often the first step toward petty theft, for, in the last analysis, eaves-dropping is stealing, say the psychologists.

Notable Introduction.

Probably the most signal introduction of the new device was at the national convention of Railway and Warehouse Commissioners recently held at Washington, D. C. The Adsits had a demonstrating model there. It proved the sensation of the convention, commissioners from eight different states crowding the room at one time. The convention was absorbed in the subject, the commissioners all having the same story to the effect that the difficulties caused by "rubbering" on party lines was the greatest cause for friction and trouble in the telephone field. It was the unanimous verdict that "listening-in" was the bane of the telephone business and that a service such as the new invention promised, would be a blessing to every community where party lines are used. It was thought that it would also be the means of relieving the commissions of the great number of protests from their constituents, who are now continuously bombarding them with complaints. The chairman of a leading state commission affirmed that "this device is the thing the country has been looking for." He predicted a great demand on the part of the telephone companies when the virtues of the new instrument became widely known.

Representatives from the commissions of California, Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Minnesota, Wisconsin, Illinois, Kentucky, Maryland, New Jersey, Mis-

souri and South Carolina examined the device. Many of them expressed their determination to have the new lockout introduced under their jurisdiction at the earliest possible moment.

Basic Patents Granted.

A large number of patents, thoroughly covering all phases of the apparatus, have been granted and others applied for. Some of these patents are of a basic nature, which cannot be used by any other company, in this line of endeavor.

C. D. Enochs, the well known telephone engineer and patent attorney is of the opinion that the Adsit interests have practically a monopoly not only in the lockout field, but in "time controlled" telephone service of all kinds. Mr. Enochs is not only an expert patent attorney, but is also a well known authority on manufacturing problems. He was, for years, in charge of the experimental and development work of the Western Electric Co., and therefore his publicly expressed opinion in a matter of this kind is of great value.

From this it can be seen why the telephone world is today agog over the startling announcement that through this wonderful invention they can now easily equip their party and rural lines and give the greatly desired private service to all subscribers, and this, without the necessity of removing or replacing one dollar's worth of their present equipment.

Gets World-Wide Notice.

The new lockout is being given a liberal quantity of publicity in many of the leading newspapers and magazines throughout the country. The Literary Digest just gave the new invention a thorough write-up, covering one whole page. The well known financial writer of the Saturday Evening Post, Will Payne, spoke in the highest terms of the new invention in a recent issue of the Post. Newspapers throughout the country are giving this new acquisition to the telephone world the heartiest welcome.

The new invention has attracted world-wide attention. Even in these troublesome war times, inquiries asking for full particulars of the new device have come to the company from such faraway places as Australia, Japan, China, New Zealand, South Africa, England, Norway, Nova Scotia, Brazil, Porto Rico, Panama, Canada, Bermuda, Alaska and Mexico.

The company reports actual and prospective orders amounting to over a quarter of a million dollars and the end is not yet. This wonderful business harvest is but a repetition of the history of other improvements in the telephone world. Since the invention of the art of telephony, nothing in connection with the telephone has ever been allowed to wear out.

As all telephone men well know, the mammoth New York City system has been rebuilt three times in the last 16 years simply to keep abreast of the times and to keep the plant in step with the latest improvements in the art. We know that the Bell people alone have spent $696,960,500 since 1900, and the expenditure by Independent companies on improvements is astounding.

Financiers Caught Napping.

Any improvement in the telephone world has called for instant adoption. The distribution of speech by mechanical means cannot be too much improved. The public is calling for greater speed and more service yearly, daily, hourly—no matter what the cost. It has been demonstrated, times without number, that if any new contrivance can make the art of telephony more satisfactory, such an invention contains within itself the germ of a great commercial possibility.

Strange as it may seem, notwithstanding the fact that the same wonderful commercial possibilities possessed by the telephone are embodied in this new lockout invention, some of the usually thoroughly alert capitalists, who keep an eye on developments in the telephone field, overlooked at first the opportunity to become financially identified with the Adsit product. Just as Chauncey Depew, about forty years ago, turned Alexander Graham Bell out of his office, even threatening to have him arrested if he returned, so were the Adsits for some time unable to secure financial assistance to enable them to bring to completion their wonderful device.

When Alexander Graham Bell stood, thirty-nine years ago, in his dingy little workshop in Boston and heard the first startled cry of his co-worker, Thomas Watson, answering him from the basement, over the rough iron wire of the first crude telephone, who could have foreseen the wonderful business future of this device, a business backed by the investment of more actual cash than has gone into any other industrial enterprise in the world? Who could have imagined the large number of telephone companies that would spring up throughout the length and breadth of this country all from this one seed?

It has been a wonderful harvest for the small investor. It is remarkable and gratifying to know that a majority of stockholders in one of the largest companies of this country own less than five shares of stock each—a greater number of whom are women—and each and every one of them, man, woman and child, now the possessors of a fortune made from timely telephone investments, alone.

As an indication of the rapidity with which fortunes have been made in the telephone world is cited the very interesting story of George Balch, of Detroit, Mich., who, May 12, 1877, on reading of the discovery of the telephone, went to Boston and made a deal with Mr. Bell for the exclusive rights to sell the telephone in the state of Michigan. Although Balch never spent a cent in promoting the use of the telephone; in fact, he did nothing with his right whatever, yet ten months afterwards he was able to sell his lease for $255,000 cash.

Some well posted telephone men aver that an exclusive territorial right to dispose of the new Adsit invention will ultimately prove almost as valuable.

According to Moody's Manual, issued last week, the small sum of $500 invested in a famous Independent telephone company only four and one-half years ago is worth today $215,000.

There are many of us who can sadly recall that we had the grand opportunity of buying Bell telephone stock at $10 per share and even less. Had some of us wise heads seen the handwriting on the wall and made but a small investment then, we would have been multi-millionaires today. There are many experienced financial men acquainted with the telephone field who figure that the Adsit stock is of the same character, and that those fortunate enough to hold even a small interest in this company will ultimtaely become disgracefully rich.

From every viewpoint, the Adsit enterprise seems to suggest this wonderful promise. There are many who predict that, as in the case of the original telephone, the new Adsit lockout will, within a few years, by the magic methods found only in the telephone world, produce another colony of the new rich, a coterie of typical American millionaires. At the start the Adsit idea met with the same cold reception given the telephone. Later, since it has become a demonstrable reality, investors are beginning to realize the wonderful possibilities.

Fairly satisfactory facilities, sufficient at least to produce the new machines on a moderate scale, have been arranged for and while the company states the present output is limited, plans are already under way to enlarge the plant to permit of a greater number of instruments being available within the next 30 days.

The marketing of this new invention and the national advertising and selling campaign now being directed from the main offices of the company located in the McKnight Building, Minneapolis, are creating deep interest throughout the country, not only in scientific circles but also among shrewd telephone investors—both large and small.—(Advertisement)